The NATIONAL GEOGRAPHIC MAGAZINE

Vol. XIX JULY, 1908 No. 7

CONTENTS

The Magic Mountain. By J. N. Patterson. Illustrated.

Notes on a Zoological Collecting Trip to Dutch New Guinea. By Thomas Barbour. Illustrated.

Among the Mahogany Forests of Cuba. By Walter D. Wilcox. Illustrated.

Notes and Scenes from Korea. Illustrated.

Some Human Habitations. By Collier Cobb. Illustrated.

Is Our Noblest Volcano Awakening to New Life? By A. H. Sylvester. Illustrated.

PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D. C.

$2.50 A YEAR 25 CENTS A NUMBER

Entered at the Post-Office at Washington, D. C., as Second-Class Mail Matter
Copyright, 1908, by the National Geographic Society, Washington, D. C. All rights reserved

XUM

THE NATIONAL GEOGRAPHIC MAGAZINE

Copyright, 1908, by the National Geographic Society, Washington, D. C. All rights reserved

AN ILLUSTRATED MONTHLY, published by the NATIONAL GEOGRAPHIC SOCIETY. All editorial communications should be addressed to GILBERT H. GROSVENOR, Editor the NATIONAL GEOGRAPHIC MAGAZINE. Business communications should be addressed to the National Geographic Society.

25 CENTS A NUMBER; SUBSCRIPTION $2.50 A YEAR

Editor: GILBERT H. GROSVENOR

Associate Editors

MAJ. GEN. A. W. GREELY
U. S. Army

C. HART MERRIAM
Chief of the Biological Survey, U. S. Department of Agriculture

WILLIS L. MOORE
Chief of the Weather Bureau, U. S. Department of Agriculture

O. H. TITTMANN
Superintendent of the U. S. Coast and Geodetic Survey

O. P. AUSTIN
Chief of the Bureau of Statistics, Department of Commerce and Labor

ROB'T HOLLISTER CHAPMAN
U. S. Geological Survey

DAVID G. FAIRCHILD
Agricultural Explorer of the Department of Agriculture

ALEXANDER GRAHAM BELL
Washington, D. C.

DAVID T. DAY
U. S. Geological Survey

R. D. SALISBURY
University of Chicago

G. K. GILBERT
U. S. Geological Survey

ALEXANDER McADIE
Professor of Meteorology, U. S. Weather Bureau, San Francisco

ALMON GUNNISON
President St Lawrence University

Hubbard Memorial Hall, Washington, D. C.

THE

HAMILTON WATCH

The National Timekeeper of America

Designed by the Best Watch Talent in the Country

Built of the Very Finest Material

Made by Workmen of the Highest Skill

Produced in a Factory of Perfect Equipment

Scientifically and Exhaustively Tested

Perfectly and Accurately Adjusted Isochronally to Temperature and to Positions

Distinguised for Supreme Time-keeping Qualities

Phenomenally Durable

Every Hamilton Watch Carries the Personal Guarantee of the Company

OUR 940 18-Size Open-face Watch is the wonderful railroad watch. Used in overwhelming numbers on all the main railroad lines in the United States.

OUR 960 16-Size Bride Watch is beautiful and accurate

We shall soon issue a perfect Watch O Size.

Any one wishing more information, address

The HAMILTON WATCH CO.

LANCASTER, PA.

Please mention the National Geographic Magazine when writing

Office Hours, 9 A. M. to 4.30 P. M. Telephone, North 306

NATIONAL GEOGRAPHIC SOCIETY

Hubbard Memorial Hall
Sixteenth and M Streets, Washington, D. C.

WILLIS L. MOORE	President	O. P. AUSTIN	Secretary
JOHN JOY EDSON	Treasurer	HENRY GANNETT	Vice-President
GILBERT H. GROSVENOR	Editor	F. B. EICHELBERGER	Asst. Treasurer
		JOHN OLIVER LA GORCE	Asst. Secretary

BOARD OF MANAGERS

1906-1908	1907-1909	1908-1910
O. P. AUSTIN	HENRY F. BLOUNT	ALEXANDER GRAHAM BELL
CHARLES J. BELL	C. M. CHESTER	HENRY GANNETT
T. C. CHAMBERLIN	F. V. COVILLE	J. HOWARD GORE
GEORGE DAVIDSON	D. C. GILMAN	A. W. GREELY
JOHN JOY EDSON	RUDOLPH KAUFFMANN	GILBERT H. GROSVENOR
DAVID G. FAIRCHILD	T. L. MACDONALD	GEORGE OTIS SMITH
A. J. HENRY	WILLIS L. MOORE	O. H. TITTMANN
C. HART MERRIAM	S. N. D. NORTH	JOHN M. WILSON

Please detach and fill in blank and send to the Secretary

Recommendation for Membership in the

NATIONAL GEOGRAPHIC SOCIETY

The membership fee includes subscription to the National Geographic Magazine

DUES: Annual membership in U. S., $2.00; annual membership abroad, $3.00; Canada, $2.50; life membership, $50. Please make remittances payable to National Geographic Society, and if at a distance remit by N. Y. draft, postal or express order.

.....*1908*

To the Secretary, National Geographic Society,
Washington, D. C.:

I nominate.....

Address:.....

.....

for membership in the Society.

.....

.....

(Write your address.)

SHORT-TERM RAILROAD BONDS NETTING NEARLY 7%

Part of an issue maturing serially April 1, 1909, 1910 and 1911. Having disposed of that portion maturing in 1909, we now offer for sale a limited amount of the Bonds maturing April 1, 1910.

Most short-term securities are in the form of notes; that is, secured only on the general assets of the Company. The bonds offered above are a direct lien on the entire property of a Railroad Company, subject only to a First Mortgage issue representing in amount only about one-half the actual cash cost of the Company's property and equipment. The Company has paid regular dividends on its capital stock for the past five years.

We will furnish a special circular on request.

FISK & ROBINSON

BOSTON 35 Cedar St., New York CHICAGO

THOMPSON FARM MORTGAGES

are secured on farms like these, and constitute the best investment known for those seeking absolute security with a just but attractive rate of interest.

¶ Agriculture is the largest and most important industry in our country. Farm land is the basis of this industry, and it follows that the farm mortgage rests on the foundation of our wealth and prosperity.

¶ The value of farm lands in the territory where I loan is constantly appreciating. In other words, your security is increasing.

¶ Let me send you my list of mortgages, varying in amounts from $100 up.

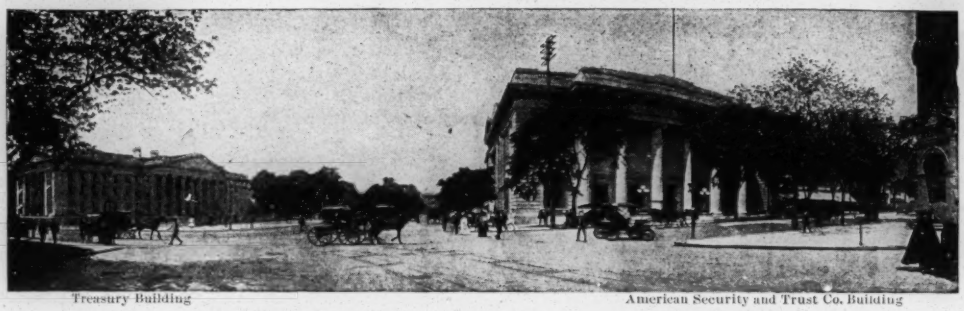
If you have funds for investment, write me.

MACKEY J. THOMPSON
514 PIONEER PRESS BLDG.
ST. PAUL, MINN.

REFERENCES:
MERCHANTS NAT. BANK
CAPITAL NAT. BANK, BOTH OF ST. PAUL, MINN.

ABSOLUTE SECURITY

Your courtesy in mentioning the Magazine when writing will be appreciated



Treasury Building — American Security and Trust Co. Building

MONEY FOR USE IN TRAVELING

LETTERS OF CREDIT

INTERNATIONAL CHEQUES — EXPRESS CHECKS

FOREIGN DRAFTS — CABLE TRANSFERS

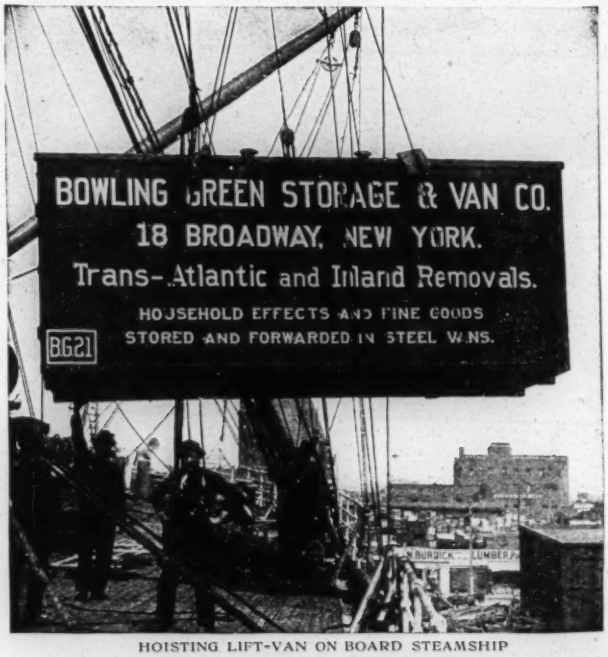
American Security and Trust Co.

N.W. Corner Fifteenth Street and Pennsylvania Avenue

Opposite United States Treasury

DEPOSITS INVITED — INTEREST ALLOWED

The Capital Surplus and $7,700,000. Stockholders Liability


BOWLING GREEN STORAGE & VAN CO.
18 BROADWAY, NEW YORK.
Trans-Atlantic and Inland Removals.
HOUSEHOLD EFFECTS AND FINE GOODS
STORED AND FORWARDED IN STEEL VANS.
BG21

HOISTING LIFT-VAN ON BOARD STEAMSHIP

LIFT-VANS will be provided for prompt loading in any city of the United States or of Europe.

¶ In no other way can Household Goods be moved across the ocean, in absolute security, with despatch and economy.

BOXING NOT REQUIRED

IN WASHINGTON, APPLY TO

Security Storage Co.

1140 Fifteenth Street N.W.

BOWLING GREEN STORAGE AND VAN COMPANY

18 Broadway, New York

Cable Address: Bowlingvan, New York — Codes: A B C, Fifth Edition, Lieber's Code

Your courtesy in mentioning the Magazine when writing will be appreciated

VOL. XIX, No. 7 WASHINGTON JULY, 1908

THE NATIONAL GEOGRAPHIC MAGAZINE

THE MAGIC MOUNTAIN

BY J. N. PATTERSON

Photographs by Professor Ferdinand Ellerman, of Carnegie Institute Solar Observatory, Mount Wilson

IN Mount Wilson, the home of the great Carnegie Institute Solar Observatory, Los Angeles and vicinity possesses what may be justly termed the greatest pleasure mountain of any populous section of the globe.

Towering at an altitude of 6,000 feet above Pasadena, Los Angeles, and the many towns and verdant ranches of the San Gabriel Valley, this remarkable mountain has gained distinction in the world of science as the destined home of the largest lens in existence. But it has other claims which need no astronomical art to reveal, and which, while enchanting the eye of the world-traveled tourist, are of greatest value to the vast area of homes whose scintillating fairyland of lights this sentinel of the Sierra Madre nightly overlooks.

It is doubtful whether as great a variety of appealing views can be enjoyed from any other mountain of the world, but it is the wonderful accessibility of Mount Wilson to the thousands of beach and valley homes outspread beneath its pine-clad summit and the remarkable climatic and physiographic change possible within half a day that makes it "the magic mountain" in the people's fancy.

A change of mind at breakfast and a change of speed at Sierra Madre from the Pacific Electric of the city to the "Burro" Pacific of the trail, and the resident of Los Angeles is able to eat luncheon over a mile nearer the heavens; may look out upon a sea of clouds, darkening the city below, and at night may see the glow of the light by which the ones at home are reading.

A plunge in the Pacific and snowballing and sled-riding before night has become such a common story with residents of this favored district as to excite no comment, and at night they can pick out the several buildings of the beach resorts over forty miles away by rail, finding it hard to realize that they were there but a few hours previous.

There is practically no end to the variety of wild mountain and canyon scenery offered by the Mount Wilson trip, but there are four general panoramic views which arouse the enthusiasm of the visitor, and each of distinctly different nature.

Looking to the south, a hundred-mile vista of valley, ocean, and shoreline reveals the buildings of Los Angeles and Pasadena flashing in the sunlight, the

distant Catalina, San Nicholas, and Santa Barbara Islands, the mountain and coast landmarks of San Diego and the country to the east, where flourish Pomona and Ontario.

On clear days the line of the breakers as they play upon the beach has been discerned by the naked eye, the arrival of the Catalina boat at San Pedro harbor noted, and on a few exceptional mornings the buildings on Catalina have been visible, 60 miles away.

Looking to the north, vast ranges of rugged mountains in the immensity of their trembling bareness suggest to the mind the upheaval of the earth's creation, and with a skyline of eight to eleven thousand feet stand between the eye and the Mojave Desert beyond.

The magnificent watershed of the San Gabriel River stretching away to the east is a foreground for the majestic whiteness of San Antonio ("Old Baldy"), and farther eastward San Gargonia ("Grayback"), San Bernardino, and San Jacinto are prominent landmarks.

Directly back of Mount Wilson to the north the West Fork of the San Gabriel River finds its source in the bottom of a gigantic bowl, the three-thousand-foot sides of which, under the softening touches of a waning sun, make a dreamlike picture not soon forgotten, calling as from another world to the tired-out worker but a few hours removed from the turmoil of Los Angeles.

The rush of the tumbling West Fork can be heard on Mount Wilson, and in summer this back country is a favorite camping ground for those who wish to lose themselves from civilization and burn their bridges behind. The mail, the telephone, and the telegraph are of another world; the use of the razor is tabooed; the daily packing and driving the burro is the only problem of life, and the business man returns to civilization in such a happy state of carelessness that he is passed on the streets unrecognized by his nearest friends.

Except for patches of woods here and there and streaks of green in the canyon bottoms, these gigantic heaps of brownness look as dry as the desert, but there are ever-flowing springs to be found on the highest ridges, and trails lead through the most impossible looking regions.

Covered with sugar pines, bearing giant cones over a foot long, Barley Flats and Pine Flats are two of the enchanted regions which beckon to the Mount Wilson Hotel guest, leading him yet a step farther from civilization. Both are well watered at an altitude of over 6,000 feet, are covered with wild barley, and are reached by the roughest sort of mountain trails.

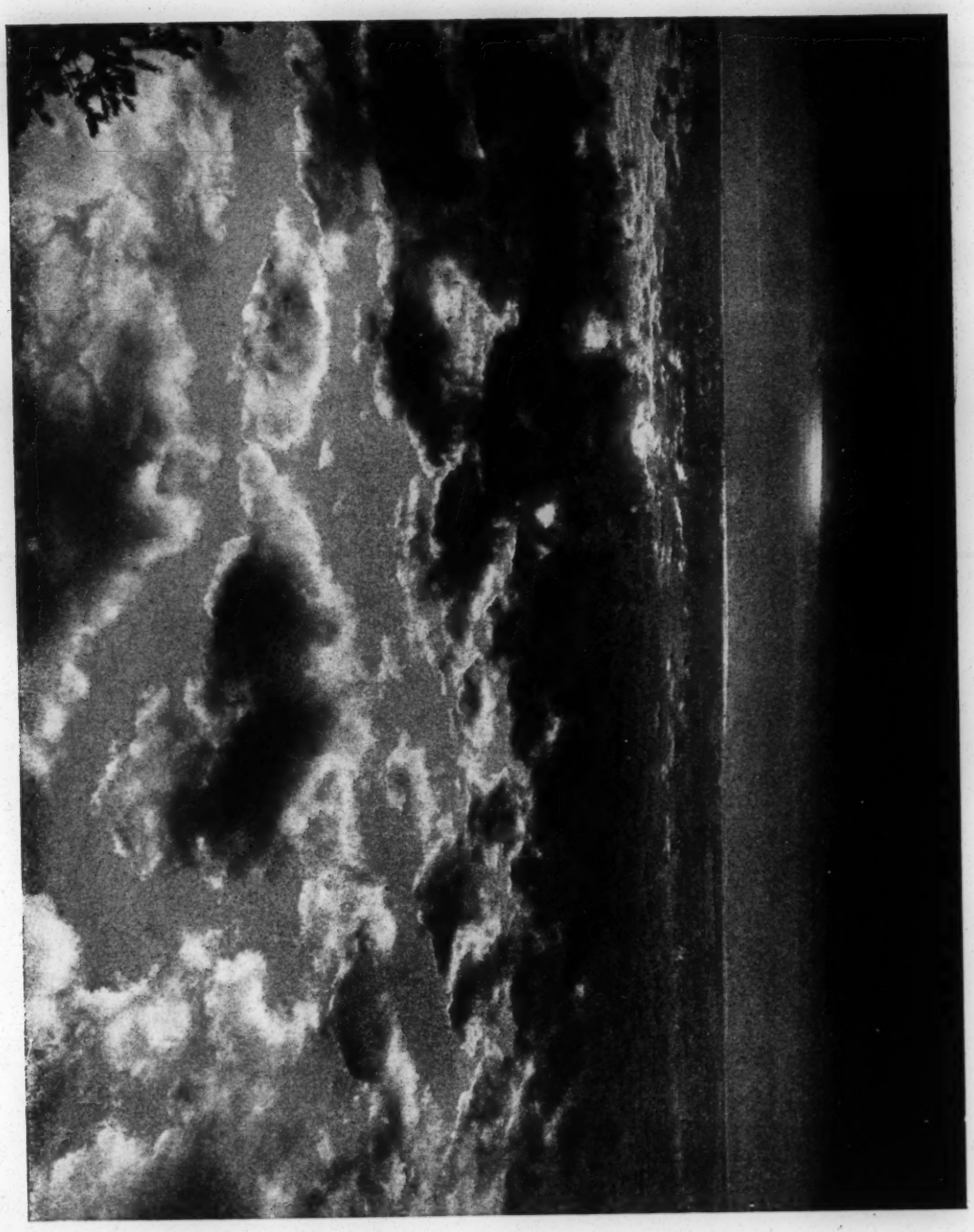
Gently rolling over the semi-flat country of this high ridge, the green carpet and pine grove of Barley Flats are so entirely different from the steep and rugged bareness of the surrounding country that the imagination seems to lift one into another country, and one half expects to see the fairy prince of nursery days ride forth in gorgeous trappings and blow a blast upon his trumpet.

This picturesque spot really has its romance in "The Horse Thieves of Barley Flats." These hardy outlaws of days gone by are reported to have operated between the Mexican border and San Francisco, using this well-watered grove of pines, commanding an extended view on all sides of any possible approach, as one of their feeding stations.

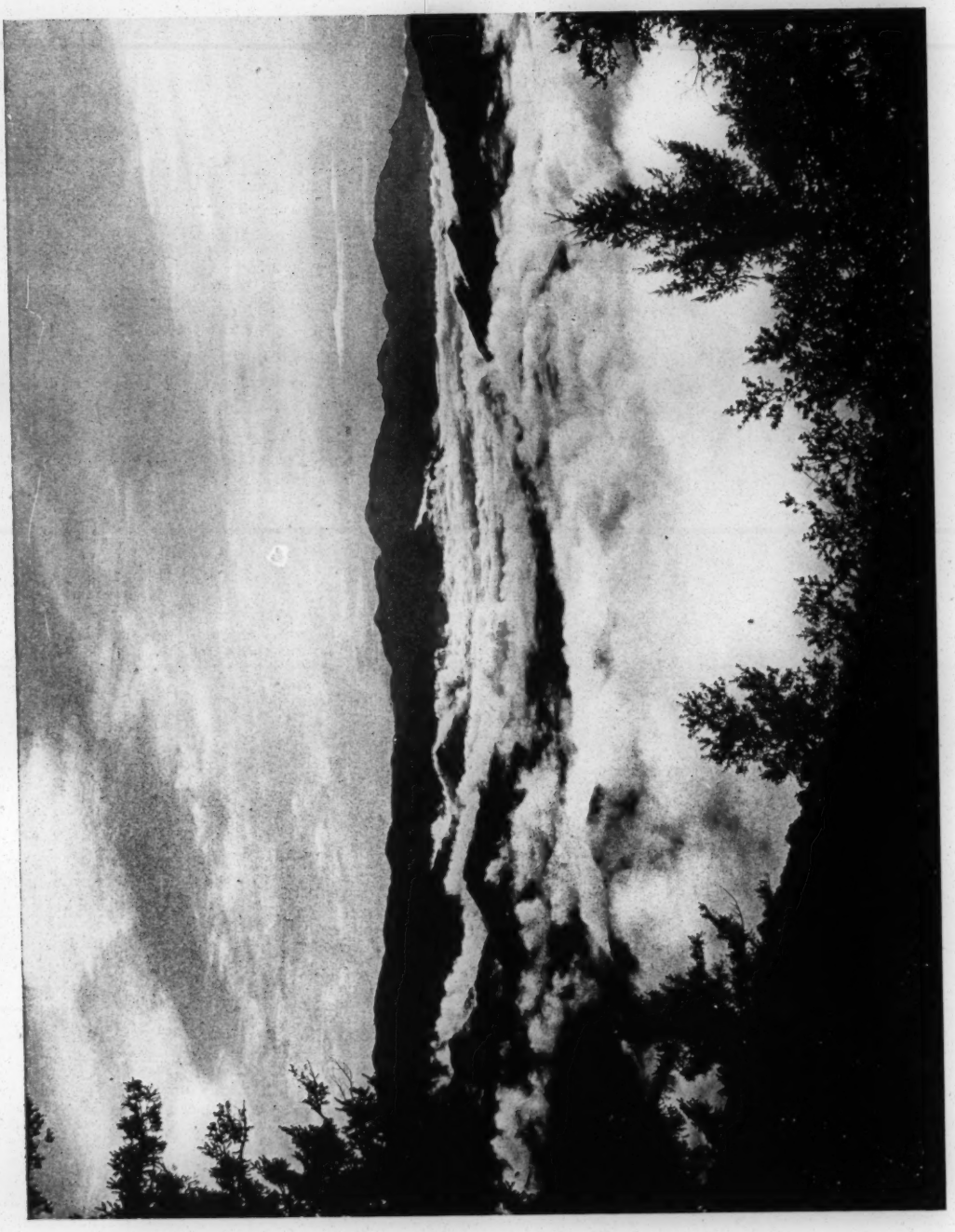
The grain which the stolen horses didn't eat is supposed to be responsible for the fine crop of volunteer barley which is now enjoyed by the hardy little burros of the Mount Wilson Hotel Company, for Barley Flats, which is in the government reserve, is leased as a fall and winter pasturage when the absence of the summer colony lessens the need of trail animals.

The burros are counted daily by telescope from the hotel, and if any do not answer to roll-call a rider is dispatched to see whether a mountain lion is at large. When the heavy snow comes, the burros are brought back to civilization, the rescue expeditions having a tough time battling with the snow-drifts.

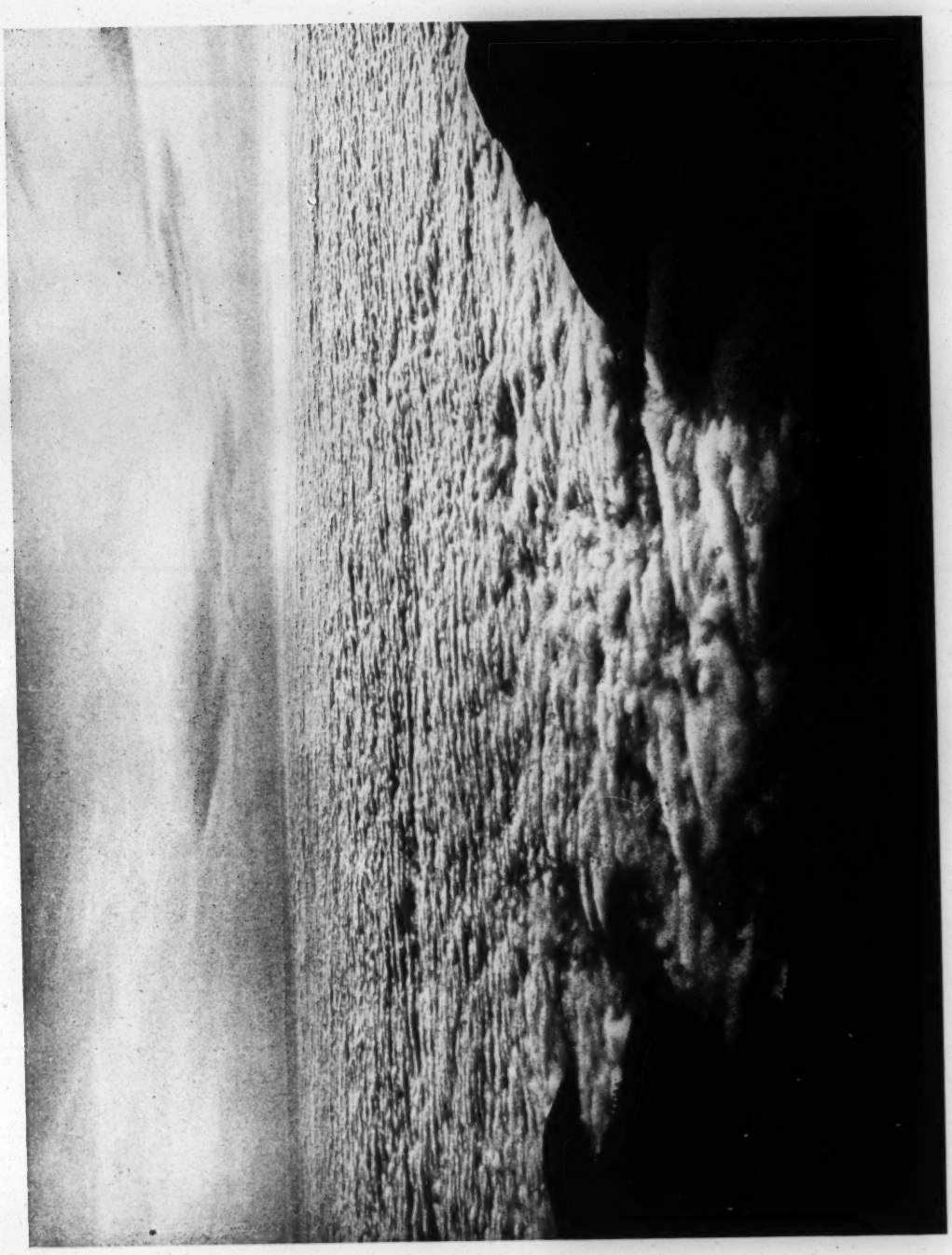
The record fall of eight feet in Jan-



SUNSET FROM MOUNT WILSON

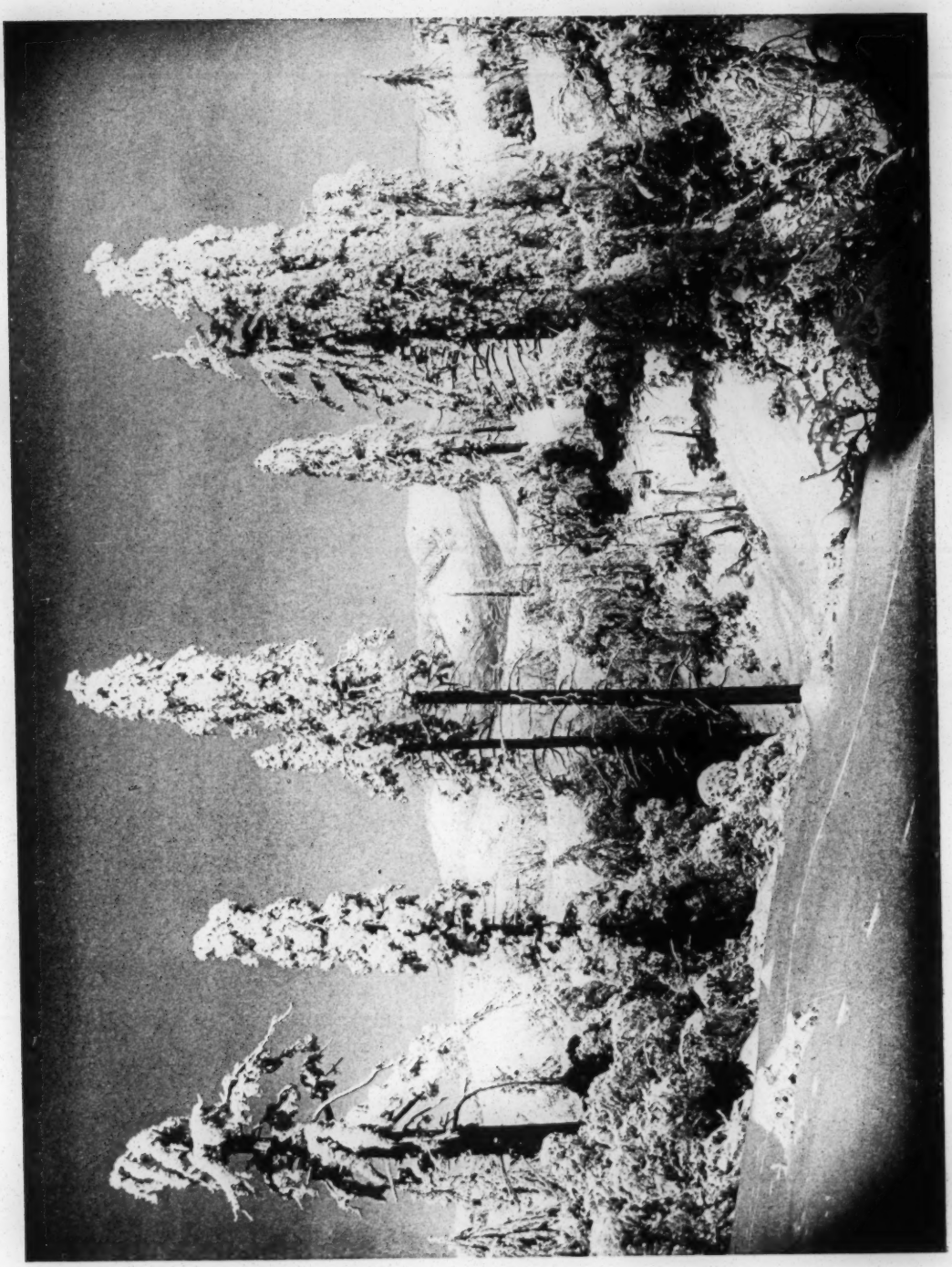


SEA OF FOG FROM MOUNT WILSON, LOOKING TOWARD SAN ANTONIO OR "OLD BALDY"

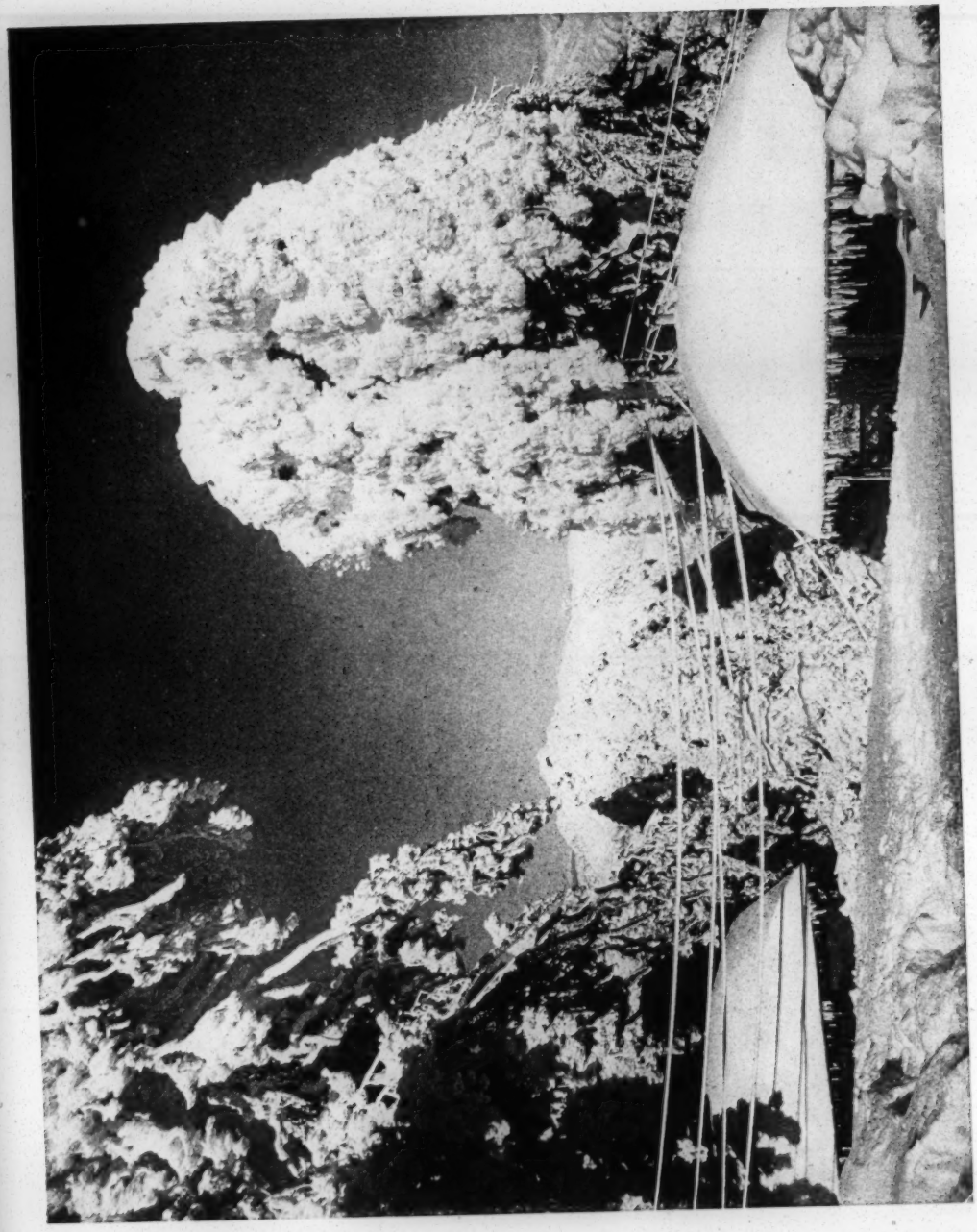


SEA OF FOG: FROM MOUNT WILSON

A STORM IN THE MOUNTAINS



ENTITLED SNOW YUCCA



COTTAGES: MOUNT WILSON IN WINTER

MOUNT WILSON HOTEL AND COTTAGES IN WINTER

Thousands each winter here enjoy old-fashioned winter pleasures, many never having before handled snow. Mount Wilson is three hours from Los Angeles to peak, one hour by trolley, and eight miles of trail

SAN ANTONIO OR "OLD BALDY" IN WINTER FROM MOUNT WILSON

NIGHT VIEW FROM MOUNT WILSON

Los Angeles, 17 miles; Pasadena, 8 miles; beach towns, 38 miles; 31 towns can be seen from here on a clear night

uary, 1907, caught the hotel people unawares, and a dozen of the patient toilers of the trail perished before the relief expedition could break its way through.

When a sea of fog is hiding the sun from the valley beneath and the peaks around Mount Wilson are revealed as islands in the midst of a vast ocean, it is hard to recall the extensive valley and ocean panorama of a few hours previous, when the green checker-board squares of cultivated ranches and the white smoke of the locomotive colored the broad level of the landscape. Mount Harvard, closely joined to Mount Wilson by a saddle and well wooded with spruce on the near side, lends greatest value to the cloud scenes, while Mounts Lowe, Markham, and San Gabriel rear their successive elevations in one, two, three order to the west.

Gradually lifting as the day advances, the level sea of fog will often break into the fluffy billowyness of shifting clouds just as the setting sun lends rose-colored tints of loveliness. Pouring over the connecting ridges and downward into the canyons about Wilson's Peak the fog, in the twinkling of an eye, forms waterfalls and rapids, and, filling into the West Fork Valley across the Sierra Madre range, constructs beautiful rivers.

The night view from Mount Wilson is doubtless unequaled by any other mountain of the world. The star-lit heavens upside down is at once suggested to the amazed tourist, who is overcome by the unexpectedness of the sparkling area of electric lights beneath him. Pasadena, eight miles distant in an air line, spreads her scintillating splendor almost to the foot of the mountain, and is connected by bands of whiteness with Los Angeles and the nearer beach towns of Venice, Ocean Park, and Santa Monica. Long Beach and San Pedro, over thirty miles away, are plainly revealed, and the location of over thirty cities and towns can be determined by their lights.

Not the least feature of Mount Wilson as a pleasure mountain for the people of Los Angeles and vicinity is the eight-mile trip by trail from the old foothill town of Sierra Madre to the peak. To those accustomed to the dryness of the valley and coast region, and who have their sole idea of the mountain from the bare southern face of the range revealed to the cities below, the wild freshness of the Little Santa Anita Canyon is a wonderful surprise.

The grateful, refreshing sound of tumbling water greets the ear, beautiful waterfalls appear in the deep canyon below the trail, the rocky banks are green with moss and ferns, and the plentiful profusion of pine, spruce, and mountain oak is a welcome surprise. Deer have been killed within two hours of Los Angeles, and the wildcat is frequently seen on the trail.

Whether the stubborn burro or "Shanks' mare" is depended upon, the excursion furnishes one of the most complete and quickest changes from the atmosphere of civilization to be found near any large city of the world. The general dryness of southern California renders the transition all the more noticeable and welcome.

NOTES ON A ZOOLOGICAL COLLECTING TRIP TO DUTCH NEW GUINEA*

By Thomas Barbour

Illustrated with photographs by the author.

NEW GUINEA, the last great area remaining in the tropics which is still almost completely unknown, has a peculiar charm for the naturalist. To be sure, its coasts have been, and are still, frequently visited and settlements exist on parts of the island, but great stretches of seaboard still remain unmapped and all but a small part of the interior is a blank on our charts.

The unfamiliarity of the average American with the whole East Indian Island region, and especially hereabouts, will perhaps be an excuse for giving a few general facts regarding the island. Lying as it does between the Equator and Queensland, Australia, its length is about 1,490 miles and its maximum breadth is 430 miles. Its area is greater than that of Borneo, being about 300,000 square miles. Politically it is divided into three parts.

The lower coasts bordering Torres Straits form British Papua, as it is now called. The eastern coast as far as 140° 47′ east longitude, with a considerable hinterland, goes to make up Kaiser Wilhelms Land, or German New Guinea. In both of these districts there are a considerable number of white settlements and mission stations; and mining and copra farming are carried on. The great western region of Papua is Dutch and it is of this region that we are dealing especially.

The Dutch section attracts the student of zoölogy, ethnography, or geology particularly. The presence of snow mountains, whose slopes have never yet been trodden by white man's foot, conjures up in the imagination endless dreams as to what new forms of life may there await a discoverer. Several well-equipped expeditions sent out by the Dutch scientific societies or by the government have failed to even reach the bases of these mountains.

Owing to the extremely unhealthy climate and the character of the natives, the Hollanders have not attempted to administer this territory as the English and Germans do theirs. Other island possessions, nearer at hand and far more valuable from every point of view, have done much to retard the Papuan trade, and now only a couple of times a year do subsidized trading vessels visit this coast. Three Residents, one stationed at Dorey, one at Fak Fak, and one at Merauke, each with a small garrison of Javanese troops, serve to represent the sovereignty of Holland over this vast region.

It is this very absence of white folk which gives this land an added interest, for here the native may be seen in his primitive simplicity. With such a bewildering variety of human types among the Papuan tribes, each speaking its own language, the ethnologist has a great field, one which is certainly unexcelled. The writer has visited the northwest and west coasts of the island with his wife and two friends, who volunteered their aid in collecting, and Chinese and Javanese helpers.

Leaving Soerabaia, in Java, a long and beautiful sail, with stops at many islands almost as interesting as our goal, brought us to Ternate, one of the old settlements of the Moluccas. Here the series of contract stops was about finished, and, thanks to the kindness of officials high in the Dutch Indian service and to the officers of the Koninklijke Paketvaart Maatschappij, we started on a number of visits to many villages, lying in bays abounding in glorious scenery and where the natives had, in some cases, seen no white men in several years. Mrs Barbour was always the greatest source of inter-

* Copyright, by Thomas Barbour, 1908

PAPUANS AMONG THE LITTLE COLONY OF TRADERS

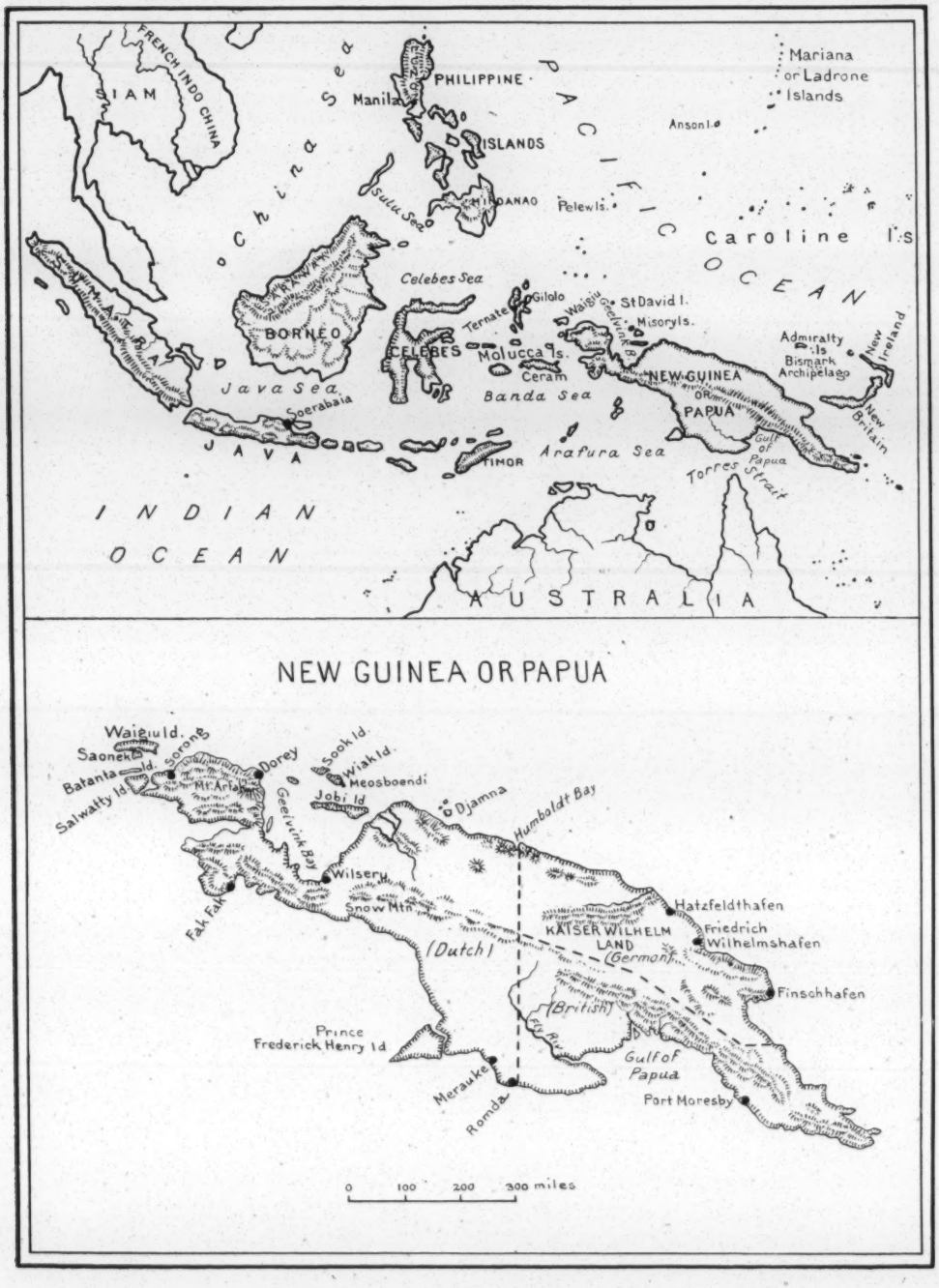
They are grouped about the Dutch Resident's house and the barracks for the half company of Javanese soldiers. The man dressed is our interpreter; he belongs to a different tribe. Dorey, New Guinea.

est, for, of course, the only white women who had ever been on this coast before were the wives of the little band of Dutch missionaries who have settled near Dorey, and these women had only been seen by the Papuans of that immediate vicinity. To attempt to give a nominal list of the stations where collecting was carried on would be as uninteresting as futile, for the names of many villages do not even occur on the Dutch Admiralty charts.

No words, however, can begin to do justice to the splendid scenery of parts of the coast. In the Pitt Passage, between the islands of Salwatty and Batanta, steep wooded hills rise from the sea on each side of the ship. A white coral sand beach and an occasional house perched on stilts in the water complete this scene, while over the bow the coast of Papua shows as a dim, low bank, as if a forest were growing from the sea. The vegetation is rank in this alluvial land, high timber, matted with creeping vines, covered with masses of orchids and rising from a bed of ferns being the feature which one encounters as soon as shore is reached. We must not forget the birds, splendid lorys, parrots of red and blue and green, white cockatoos, and gorgeous pigeons greet one's first ramble ashore.

MAGNIFICENT BUTTERFLIES

It was the writer's good luck on his first stroll to find a tree flowering high in air which was being visited by a host of the splendid bird-winged butterflies, *Ornithoptera poseidon*. The feelings of one who has hitherto only known these visions in black and green and gold as they lay pinned in a cabinet were never better expressed than by Wallace, who wrote in his Malay Archipelago the following, after he had taken this species in the Aru Islands: "I had the good fortune to capture one of the most magnifi-


FRENCH INDO CHINA
SIAM
China Sea
PHILIPPINE ISLANDS
Manila
Mariana or Ladrone Islands
Anson I.
PACIFIC OCEAN
Sulu Sea
MINDANAO
Pelew Is.
Caroline I.s
Celebes Sea
Gilolo
Waigiu
St David I.
Misory Is.
Geelvink B.
BORNEO
CELEBES
Ternate
Molucca Is.
Ceram
Admiralty Is.
Bismark Archipelago
New Ireland
NEW GUINEA OR PAPUA
New Britain
Java Sea
Soerabaia
Banda Sea
JAVA
TIMOR
Arafura Sea
Gulf of Papua
Torres Strait
INDIAN OCEAN
AUSTRALIA
NEW GUINEA OR PAPUA
Waigiu Id.
Saonek Id.
Batanta Id.
Salwatty Id
Sorong
Dorey
Mt. Arfak
Sook Id.
Wiak Id.
Meosboendi
Jobi Id
Geelvink Bay
Djamna
Humboldt Bay
Wilsery
Fak Fak
Snow Mtn.
Hatzfeldthafen
KAISER WILHELM LAND
(Dutch)
(German)
Friedrich Wilhelmshafen
Finschhafen
(British)
Prince Frederick Henry Id
Merauke
Romda
Gulf of Papua
Port Moresby
0 100 200 300 miles

PAPUAN WOMEN

The women of Dorey are well dressed, mainly through the efforts of Mr van Hasselt, for 43 years a missionary in Papua. No converts are made, except where a few slaves are purchased and adopted. The only effects are seen in the help which modern medicine has been to them; though it must be said that none of these races are ever as healthy as before they submitted to clothing.

cent insects the world contains, the great bird-winged butterfly (*Ornithoptera poseidon*). I trembled with excitement as I saw it coming majestically toward me, and could hardly believe I had really succeeded in my stroke till I had taken it out of the net and was gazing, lost in admiration, at the velvet black and brilliant green of its wings, seven inches across, its golden body, and crimson breast." At Sorong these were flying very high, as is their wont, but by climbing the tree and using a small collecting gun and dust shot, out of a number brought down, some almost perfect ones were obtained. Later we got the chrysalides and splendid examples emerged after about thirty days.

In coming to Papua from Malasia it is the sudden contrast in the people which makes the most startling impression on one's mind. The Malay, grave, reserved, and dignified, is as unlike his New Guinean neighbor as a Chinaman is unlike a European. These islanders are a happy, boisterous lot until some little thing offends them, when they at once become sullen and treacherous; but as we had no occasion to cross them, we got along most admirably. They often helped us collect with real enthusiasm, a set of rude drawings of various beasts showing them for what we would barter.

Over all Dutch New Guinea tobacco, or "sembacoo," as the natives call it, is the most sought for "trade." Next in popularity comes brass wire, then cloth, red being demanded in some localities and blue in others. Beads and knives are also most useful. The tobacco is put up for this trade in Rotterdam, marked "The Rising Hope" (in Dutch), and contained in a blue wrapper; curiously enough any other sort is absolutely refused by the people. They smoke it and chew it. They are very fond of walking up to you and taking a cigar or cigarette directly from your mouth and walking away puff it with perfect unconcern. When going ashore every article of value (from the Papuan standpoint) must be left behind. The conception of the difference between *meum* and *teum* is not definite, and to try to keep a thing from a native by force is—well, a proceeding of doubtful safety.

In the extreme northwest of New Guinea and on the neighboring island of Waigiu the people are similar. Here has taken place the longest intercourse with the Malays, for until the Dutch came, the Sultan of Ternate was suzerain of this part of Papua. There has been a mingling of blood, as is shown by some individuals being of a lighter color than is common, and also by the occasional occurrence of wavy instead of curly hair.

The pure Papuan is very dark brown, usually a well-built, thick-set man of medium height. Occasional individuals are seen who are slight, short, and who have strongly marked Negrito characteristics. These probably represent survivals of the very earliest human inhabitants of the region, as were the Negritos in the Philippines. Out on the Pacific coast toward German territory the human type is markedly different. Here in varying degrees we meet people who have characteristics of other island groups to the eastward, for there have probably been accidental colonizations along this shore by both Melanesians proper and Polynesians. To attempt to describe these physical types would be beyond the writer's powers and the scope of this paper; the photographs serve to illustrate this point.

The houses which these people build are of much interest. They are generally well made, often with attempts at artistic decoration, and always most picturesque. In the northwest the Malay type prevails. We find each family with its own house. This is placed on poles out in the water with sides of "attap," or pandannus mat, and roof of thatch. This thatch is made by taking sago palm leaves and braiding the blades all on one side of the midrib. These are then laid on as clapboards would be, and make an excellent water-tight roof.

COMMUNAL HOUSES

In Geelvink Bay, at Dorey, Roon, or on Jobi Island the regular house is a long communal structure. These great "turtle-back" houses shelter from 80 to 100 people. They eat and sleep generally in

a long corridor, which runs lengthwise through the building, while on each side lead off small rooms, in which the private belongings of each family are stored.

The men lounge regularly on the front piazza, often lying prone with spear or bow and arrow ready for any fish which may happen by. The people show most wonderful skill in striking or shooting into water; they seem to be able to allow for the refraction to a nicety. The women work on the back piazza, nearest the forest-covered shore—convenient agents to spread the alarm should an attack be made by some marauding land tribe. The canoes are moored at the front of the house. Evidently the Papuan warrior looks first to his own safety.

On Wiak Island the houses were of another sort; similar in shape, they were set in two different positions. Some were over the water, as we had often seen before, while others were set on high bamboos among the trees of the deep forest. These houses were generally three-roomed, one opening out on each end, and a third between these having a side door. We saw little of the people or their doings. They have a very bad reputation for treachery. The women were shy, hiding always deep in the bush and our photos here were very unsatisfactory.

Whenever the women came out to meet the ship along with the men we felt quite safe to go ashore and wander at will through the deep pathless forests; but here at Meosboendi only men came out in the canoes, armed men carrying many spears, bows, and quivers full of short bone-tipped arrows. They were drinking heavily of their home-brewed "sagoeir" and were in a generally bad frame of mind. A few on shore stood for their picture, but most would not, and the women ran off helter skelter and took refuge in their high houses.

On a previous trip the captain of the trading steamer was standing on the beach leaning against a tree, when a Wiak man walked up and drove his spear through him. For some years the Dutch government prohibited trading with these people as a measure of reprisal, and we left safe and sound after what was one of the first trips since the ban had been removed. At Korido, a village near Meosboendi, on Sook Island, the people on a previous trip had met the steamer with a shower of spears. No trading by white people has ever been done here and we did not attempt a landing. That an occasional Malay trading prau gets this far was testified by the fact that many of the Papuan had spear-heads of iron, shaped as are the spear-heads of the Buginese Malays about Makassar.

From Wiak it is a short journey to Jobi Island, another of the group which lies in the mouth of Geelvink Bay. The people here vary little in appearance from the other Papuans of the region, but their manners and customs differ much from village to village. Indeed, while this island is hardly larger than Long Island, New York, eleven mutually unintelligible languages are spoken on it. Many feuds exist, and when our ship came to anchor in Pom Bay, canoes attracted by the smoke and which had come from neighboring harbors did not spend the night even close to the ship, because their occupants were afraid of the people of Pom.

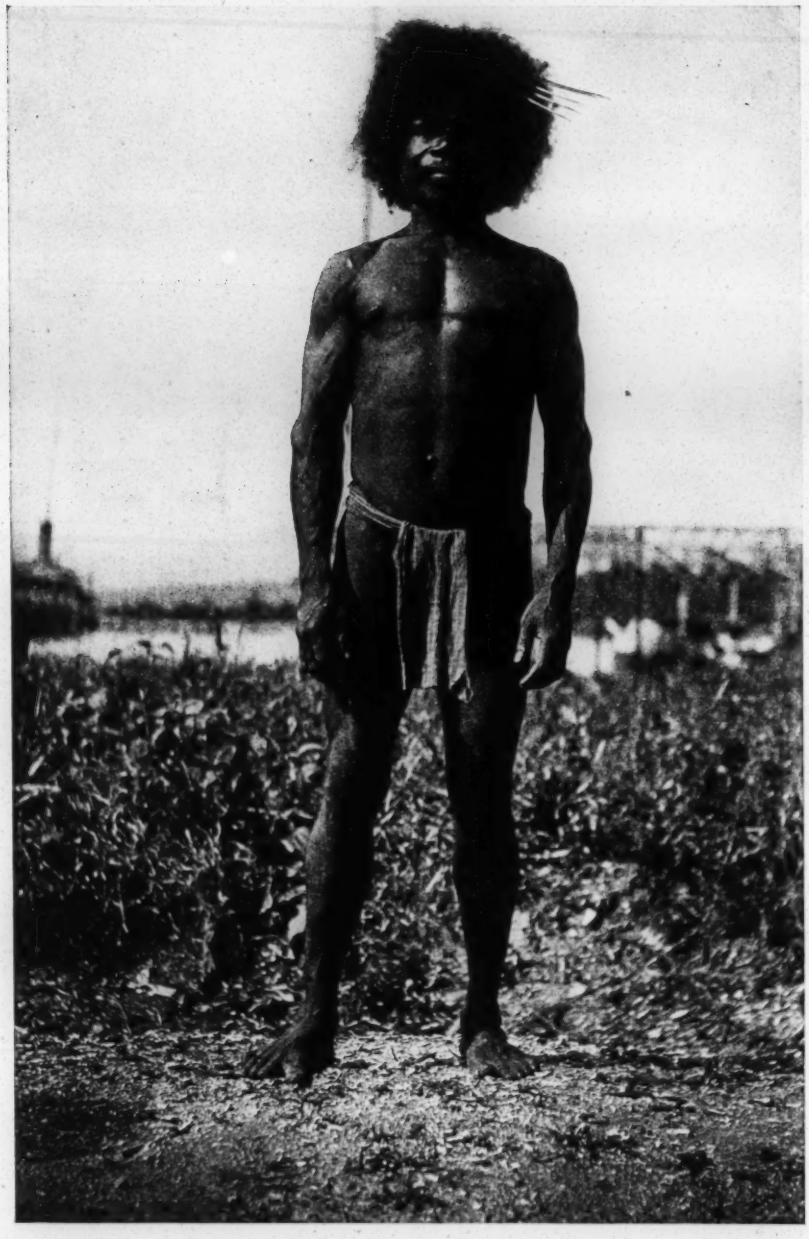
In the houses here a goodly number of heads were seen, the products of recent raids. In one house we tried to barter for some of these, but through a man who could speak Malay we learned that, as the possessors claimed, these people whose heads we saw had been such notorious villains that the Dutch gunboat last seen had brought permission for this tribe to go and kill them. Of course, their heads must be kept as proof of the meritorious act. No gunboat had visited the bay for years! The heads were fresh.

CANOES

The raiding canoes of Pom were enormous affairs, with bows decorated with fretwork carving, in elaborate designs, and with wooden heads which were made to look like real ones, by having enor-

PAPUANS NEAR THE MISSION AT DOREY

They are considered civilized for New Guinea, and are very erratic. One moment a coat or pair of trousers may be worn and the owner be proud of his finery; the next they are thrown into the bushes as a nuisance

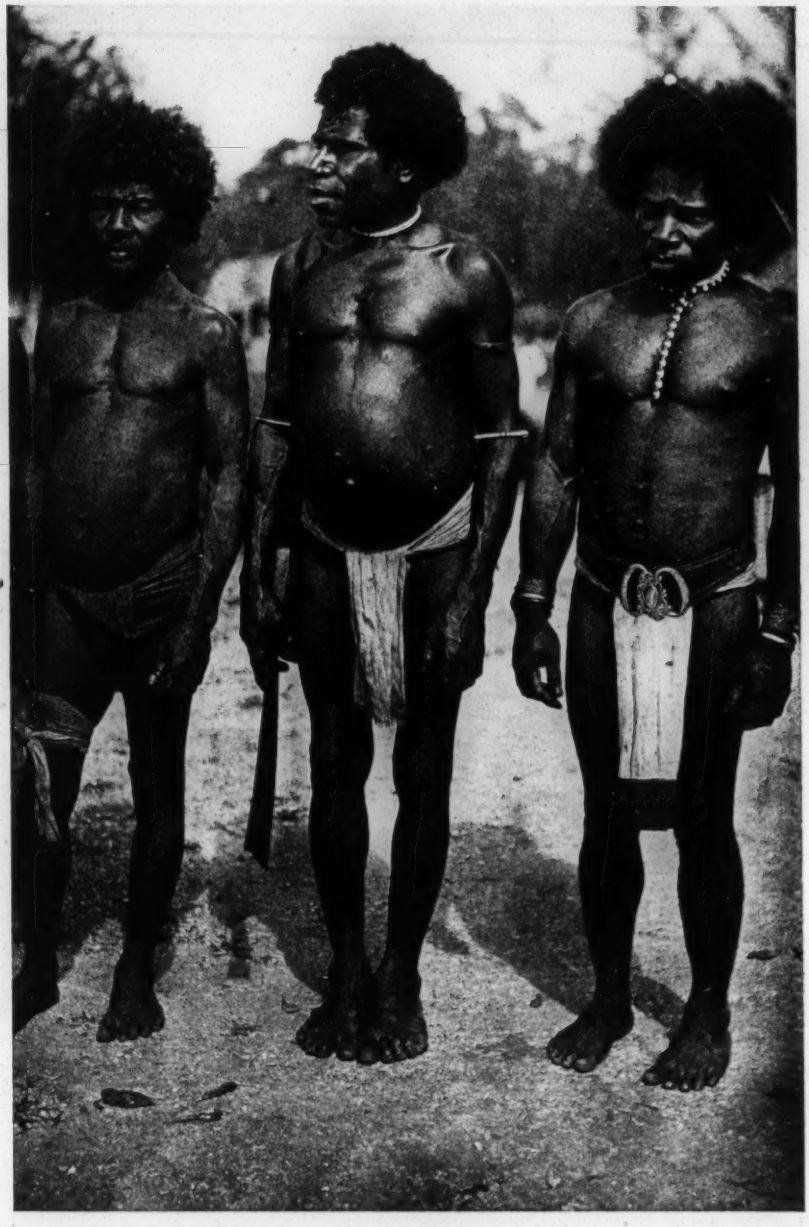


A PAPUAN OF DOREY

In his hair may be seen the ends of the prongs of a hair comb, which is made from the wing spines of the cassowary. Notice the space between the great and second toe. For ladders, poles are used in which notches are cut for the toes.

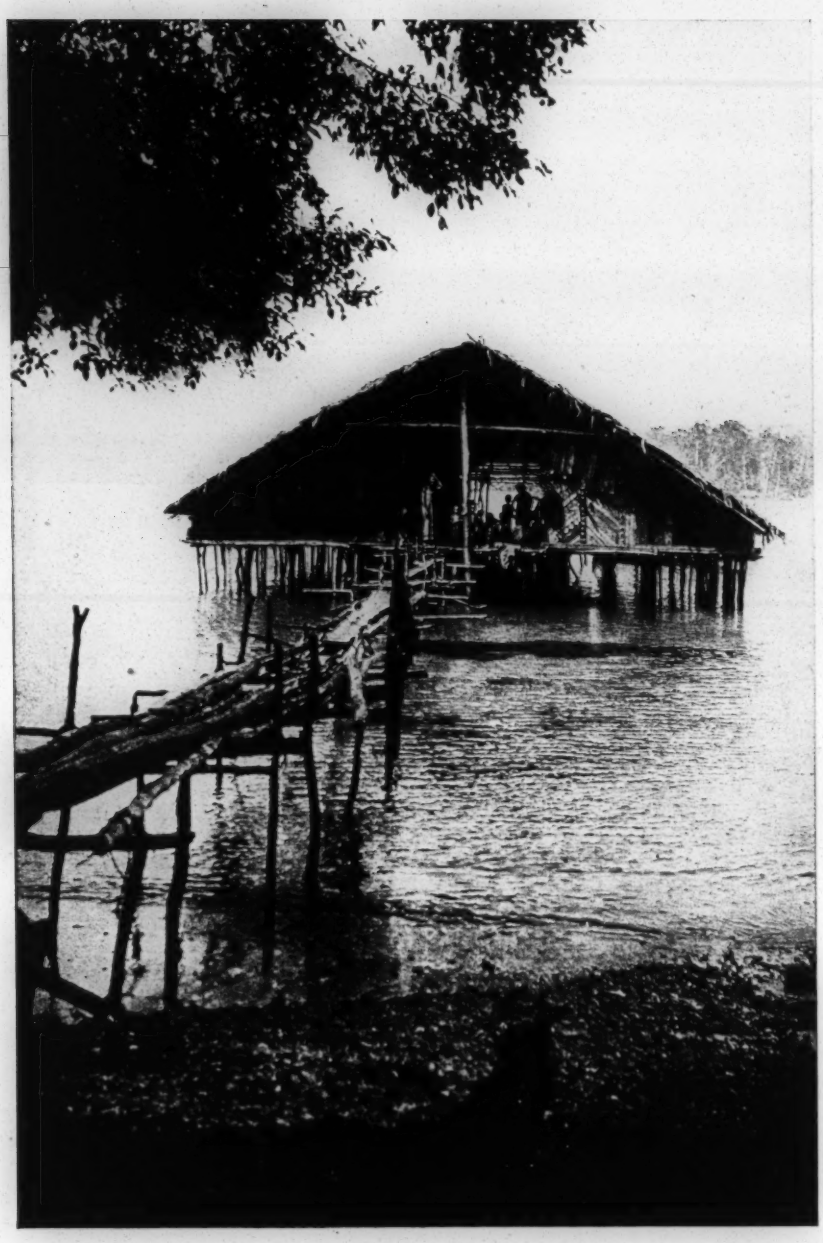
ONE OF OUR BEST PAPUAN HELPERS AT DOREY

This man was a good collector and may be seen here proudly displaying his pay. A knife, a tin can, and a key on a string he was almost as proud of as of his splendid head of hair and the decorated bone pin which he had thrust through his nose.



MEN OF DOREY

The man on the right has in his hair the comb which is in general use among all Papuans. It resembles a long-tined fork and is made of split bamboo, or more often of the long spine-like feathers, which are found on the side of the cassowary where most birds have wings.



THE END VIEW OF A COMMUNAL "LONG HOUSE" NEAR DOREY

The decoration on the end shows the space for the separate rooms. The corridor through the middle of the house is the common lounging place. One wonders how it is possible to use the bridge; the poles roll about and there is no hand rail; still it is done, and even by young children.

PAPUAN CHILDREN

The children are at home in the water at a very early age. They often paddle about alone in tiny dug-out canoes of their own

mous mops made of cassowary feathers stuck to them.

A word about New Guinean canoes is in order here. They vary among the different tribes as do all the other products of their handicraft. In some places they have a single outrigger, in others two. At Djamna and the Humboldt Bay they are elaborately decorated with figures at bow and stern, and often with conventional designs burned on the hull representing sharks and flying fishes. Here again the photos show better than verbal descriptions the way these crafts are put together and their varying types. The basis of all is a great hollow log prepared with fire, and often still with the primitive stone axe. To the sides of this are sewn two strips of wood, which go to form the gunwales. In almost every case where the canoes are sailed, sails made of woven pandannus leaves are used. A tripod generally serves as a mast among the Geelvink Bay islands. The paddles of this region are short-handled and devoid of ornamentation, while at Humboldt Bay they are long, so that a man may paddle standing. Here also they are often most beautifully carved.

For weapons the bow and arrow are general. In some places they are as elaborate as human ingenuity can devise, the arrow shafts decorated with burned and incised designs, ornamented with tufts of feathers, often from the Birds of Paradise, and with tips of bone or burnt wood. These tips are elaborately carved with many series of barbs and are certainly savage-looking weapons.

They are not knowingly poisoned, but we are told that they are thrust into the body of a dead warrior and left to absorb some of his valor. The valor is doubtless most effective in causing in this damp equatorial climate swift and sure blood-poisoning.

Spears are often used, as well as arrows. Some are bamboo, like great cheese scoops, while others are tipped with human bones or the shin-bones of cassowaries. Shields occur sporadically and not many of the tribes in Dutch territory know of them. The people of Wiak make them long and narrow for parrying; they have crude designs daubed on them with native pigments, and on top they are surmounted with a grinning face and mop of cassowary feathers for hair. Daggers are only known in Humboldt Bay. They are made of thigh bones, usually, splintered to a sharp point on one end, with the other end worked

PAPUAN CANOES

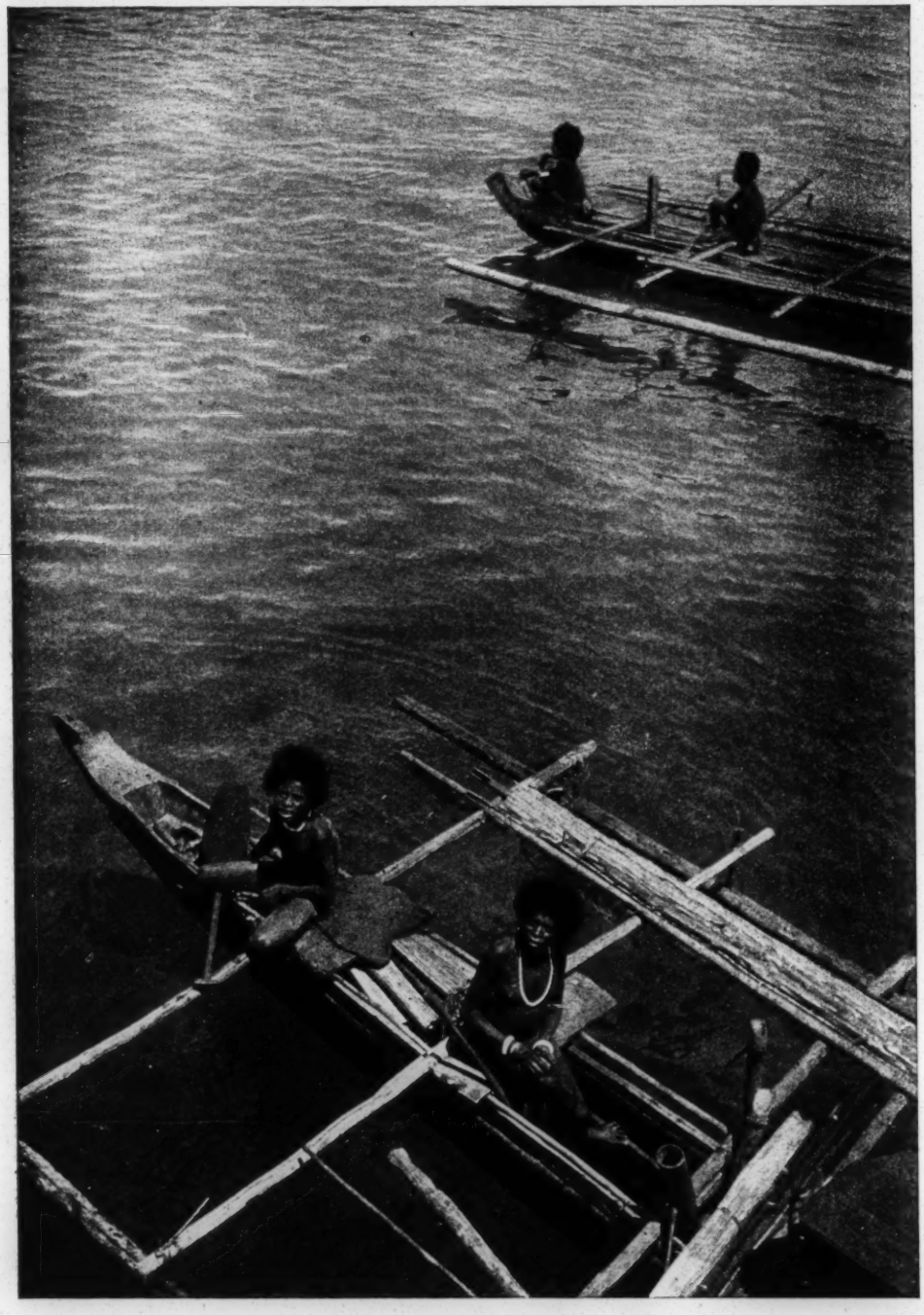
The people rest themselves by folding up; they never sit as we do. Note the tripod for holding the mast

smooth for a handle. They also are often beautifully carved.

The artistic sense of these people is strongly developed, and the amount of time and pains which will be spent in decorating every gourd or joint of bamboo for household use is astonishing. Their tools, of course, are the most primitive, for of metals most of them know nothing.

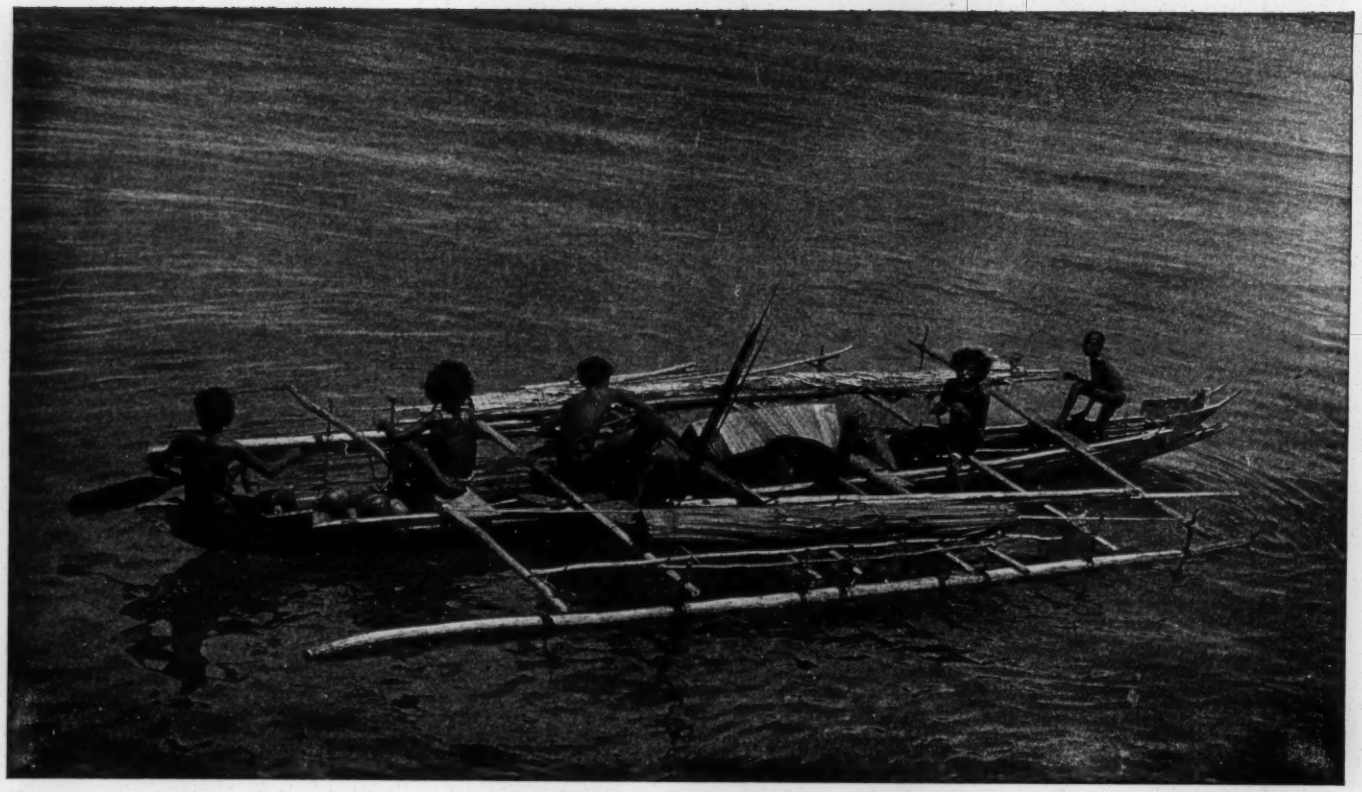
The religious life of the people is still very imperfectly known; here again a great field awaits the student of ethnology. Their methods of burial vary greatly and are interesting, to us often disgusting. These subjects, along with an account of the little-known tribes at Djamna and Humboldt Bay, will be touched on in a subsequent paper.* The author will feel that he has been more than repaid for the discomforts of this trip if he has awakened an interest among Americans in this wonderful region—a country which, in spite of drawbacks in its climate, its notorious unhealthiness, and its often rather inhospitable or even dangerous inhabitants, will always remain the most interesting region he has ever visited.

*To be published in the August number of this Magazine.



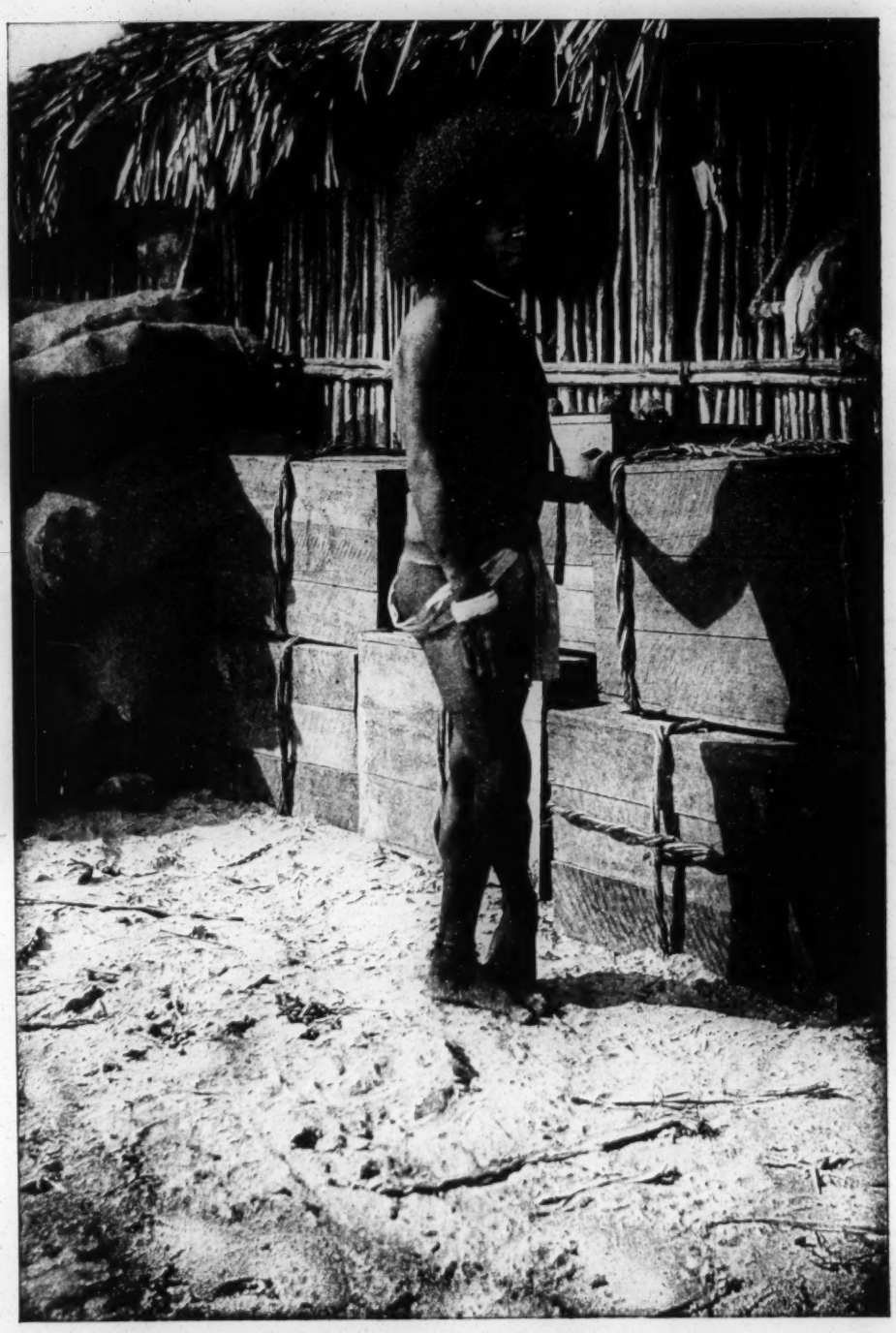
JOBI ISLAND WOMEN

Photograph taken from the ship's deck. It was a sign of great confidence for the women to come so near; they are generally most shy



A WIAK ISLAND CANOE

Note the pandannus-leaf sails rolled on the outrigger stays. The spears stand ready for use in a joint of bamboo. The roof-like object in the canoe is a rain coat, a long hood of pandannus mat which is hung from the head down the back. The people dislike water in every form.



ONE OF THE SURLY MEN OF MEOSBOENDI, WIAK ISLAND

In the boxes was the dammar gum which these people collect and which the ship's crew pack up and take on board after it has been paid for in "trade." These people are one of the most dangerous in the whole region to have any dealings with.

AMONG THE MAHOGANY FORESTS OF CUBA

By Walter D. Wilcox

Author of "Camping in the Canadian Rockies," "The Rockies of Canada," Etc.

THE Bay of Cochinos, on the south coast of Cuba, is about forty miles west of Cienfuegos. It is the largest protected bay in Cuba, with a length of over 15 miles and an average breadth of about four miles, great depth of water, and very fair protection from the sea, and it is surprising at the first glance not to find a thriving port town located here. On the contrary, this is one of the wildest and most sparsely populated parts of Cuba.

Until within a few years this bay was said to be the resort of brigands and bad characters of all kinds; the waters were supposedly infested with sharks and other dangerous fish and the shores with crocodiles, while the swampy interior was the reputed breeding place of innumerable mosquitoes. The days of piracy are past, and while crocodiles and sharks do abound, no fatalities have ever occurred.

The isolation of this region, to which may be attributed the vagueness of these evil reports, is due to the fact that this entire coast is hemmed in by a line of almost impassable swamps more than fifty miles in length, called the Cienaga de Zapata, which cut off communication with the interior. Then, too, the comparatively new city of Cienfuegos, situated on its beautiful land-locked bay, which Humboldt pronounced one of the most magnificent harbors in the world, has served as an outlet for the adjoining region.

In connection with the purchase of a timber tract on this bay, I had abundant opportunities to learn many interesting facts about the region. On the first visit a small boat was engaged to sail from Cienfuegos. Under the influence of a fresh land breeze, the forty miles westward along the rocky coast were run in the night, and early the following morning the boat was well within the Bay of Cochinos and approaching a low, flat shore covered by a uniform expanse of green forest. Above the tree-tops the sky was a rosy red in the early dawn. It was a typical midwinter day in the tropics—the bay smooth as a mirror; the cool air laden with forest odors and the perfume of flowers, while the chattering of wild parrots could be heard from the shore. Our captain entered a small river or inlet and poled the boat to a convenient landing place.

A year later, at this same spot, a landing was made with a force of carpenters and laborers and a cargo of lumber and tools. A place was cleared in the forest for a house, docks were built, gardens laid out, wells dug, and eventually a permanent home made, comfortable enough to house my family during the succeeding eighteen months.

In all that time we were not molested by the natives, and no case of illness occurred in any member of the household. It seems that malaria and yellow fever are unknown among the natives of this entire region.

HERONS, WHITE EGRETS AND CROCODILES

The encircling shores of Cochinos Bay are low and flat. The west shore is a sandy beach four or five feet above the water. This coast is often a mere strip of dry land separating the bay from swampy tracts and lagoons full of mangrove trees. Herons and various wading birds, including the white egret, sought for its feathers, abound here in great numbers. Hunters shoot the latter bird by the hundreds, unfortunately in the breeding season, because the feathers are then at their best, and only the inaccessible nature of these lonely lagoons and the plague of insect life prevent their total extinction.

Crocodiles likewise abound, and in the night-time may be heard catching birds near the water's edge. During the last two years some eight or ten men have been constantly employed killing crocodiles in the depths of the swamps and carrying on a profitable business selling their hides. In the remote parts of the swamp, where the great reptiles have never been disturbed, they are easily killed. An old hat is placed on the end of a short stick, which is held in the left hand and waved over the water. The crocodile rushes blindly at the hat and is struck a sharp blow behind the head with a machete.

Sharks infest these shores and often swim in the water so shallow as to become half stranded on the sandy shoals. Natives say that in the old days this bay was a resort for pirates and slave traders, and that the sharks were originally attracted by the large numbers of dead and dying slaves thrown overboard.

IN THE MAHOGANY FOREST

The east shore is entirely different, totally devoid of sand beaches or swampy tracts, and is a rocky plain from five to ten feet above sea-level, covered by a heavy forest, which extends eastward three or four miles to the edge of the swamps.

The number of species of trees is very great, and, while including such splendid varieties as mahogany, sabicu, ebony, and Spanish cedar, there are many other hardwoods, probably 150 in number, some of which are very rare or quite unknown to experts in tropical timbers. Some of these trees have a wood harder than ebony, and the best steel axes are frequently broken in felling them. Many are fine-grained and beautifully banded and veined with two or more colors, and are susceptible of a high polish.

The mahogany and cedar are imposing trees, the latter sometimes reaching a diameter of seven feet. Their massive branches, hung with purple and yellow orchids, bromeliads, ferns, and other parasitic plants, are the resort of parrots and other birds of brilliant plumage. In contrast, the silent swamps present a different aspect. The forest is interrupted by stretches of open prairie, by slow-flowing streams of great depth and clumps of heavy trees, hung with long shrouds of gray Spanish moss or overrun by climbing cactus, mistletoe, and orchids, which in early spring make a gay display of white, yellow, and purple blossoms. The royal palm here reaches its maximum size, the stately trunks, symmetrical as Grecian columns, rising more than a hundred feet to spread their crowns of foliage in the glistening sunshine above the dark and sombre forest.

The swamp water, having general currents toward the sea and eventually escaping by underground channels, is clear and perfectly wholesome, with, however, a slight taste and color of vegetable matter. Many of these lagoons are very picturesque, especially where long vistas open up in the forest and display the overhanging foliage dipping down to the water surface. These black pools are occasionally disturbed by the splash of a crocodile or the rising of the "sevalo," a kind of fish that comes from the sea through subterranean passages and rivers which drain the swamps.

The general land surface, while perfectly level, is rocky and the soil is very scanty, being apparently washed down into the numerous cracks and joints in the rocks. It seems remarkable that trees of great size can and do grow on such little soil, and one often sees their long roots spreading over the ground for twenty yards or more in search of some hole or crevice to descend. The soil, however, is remarkably fertile, and such plants as reach down deep enough to be independent of surface conditions of moisture and drought succeed admirably. Bananas, limes, and oranges of delicious flavor and quality are raised in several places near the bay. Vegetables and small fruits succeed only when sufficiently watered, as the light, porous soil dries out very quickly. The rocks are entirely of coral formation, very hard and rough on the exposed surface, but underneath turning to a soft, yellow

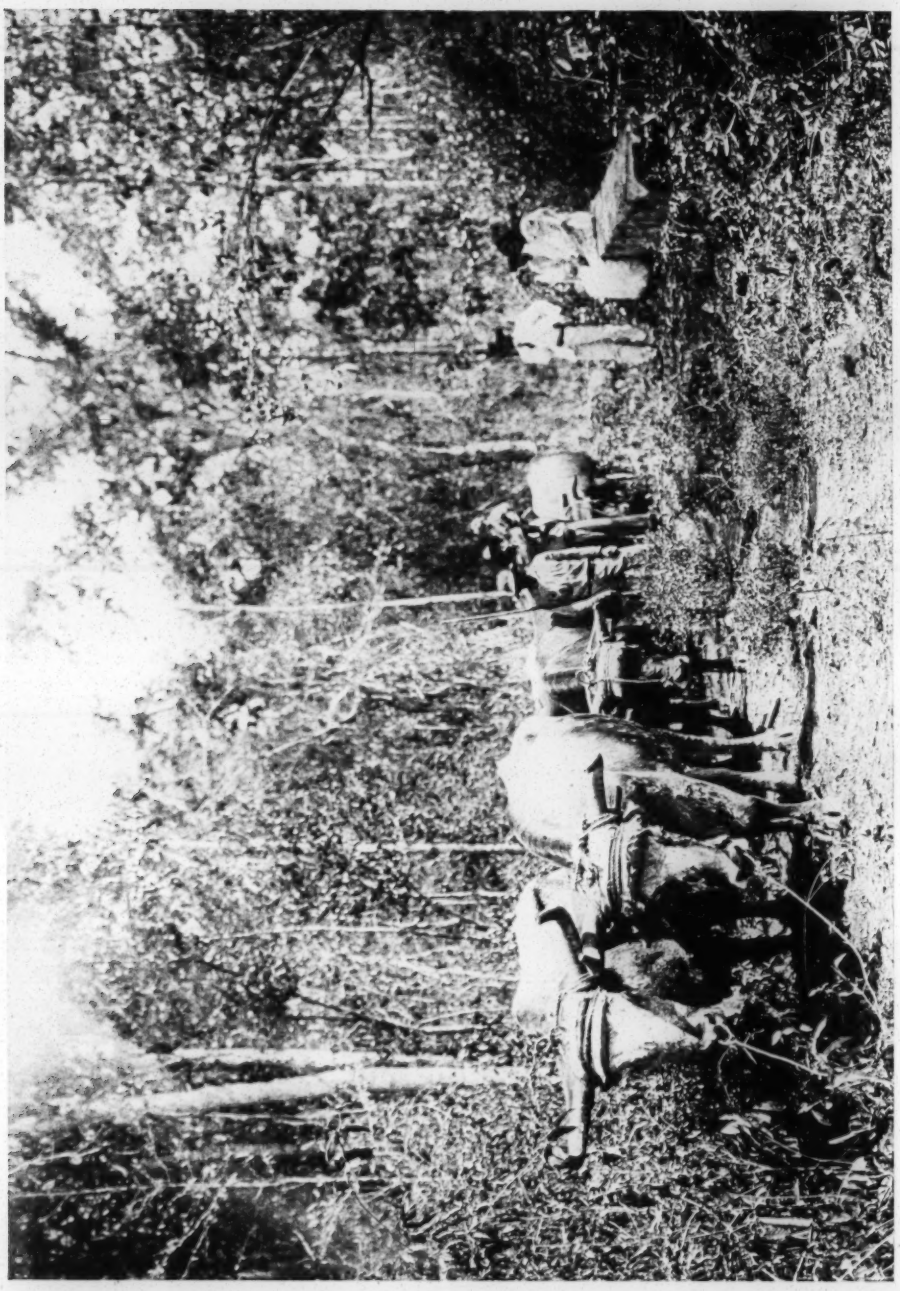


Photo by Walter D. Wilcox

HAULING MAHOGANY LOGS FROM THE FOREST: COCHINOS BAY, CUBA

Photo by Walter D. Wilcox

A FIELD OF CORN IN A CLEARING

Six months before this picture was taken the field was covered with a dense tropical forest: Cochinos Bay, Cuba

stone made up of shell fragments and corals similar to existing beaches on the western shore of the bay.

Outside of two or three poisonous plants, these forests contain very few dangers of any kind. The poisonous manzanillo tree spreads its picturesque branches out over the rocky shores and drops its green apples into the sea. Certain fish eat these apples, and in some cases, when caught at the critical time, have caused fatal cases of poisoning. The milky juice is feared by every Cuban axeman, who will never under any circumstances fell one of these trees, a single drop in the eye being sufficient to cause total blindness. Snakes are abundant, but universally harmless, while the sting of Cuban scorpions and centipedes is little worse than that of honey-bees. One native nearly ninety years old has spent forty-five years on his clearing in these woods and is still strong enough to do all his work.

THE CHANGE OF SEASONS

At the close of winter, in March and April, the forest loses a great part of its foliage, while some varieties of trees shed their leaves altogether. This period marks the close of the dry season. The entire forest when seen from a distance is suffused with a reddish glow, as the old leaves fall and the new ones burst from their buds. This is in many respects the finest part of the year in Cuba, an uninterrupted succession of bright sunshiny days, with an ideal temperature both day and night. The forest revels in a profusion of flowers, one kind of tree succeeding another in its time of blossoming, and the air is sweet with the

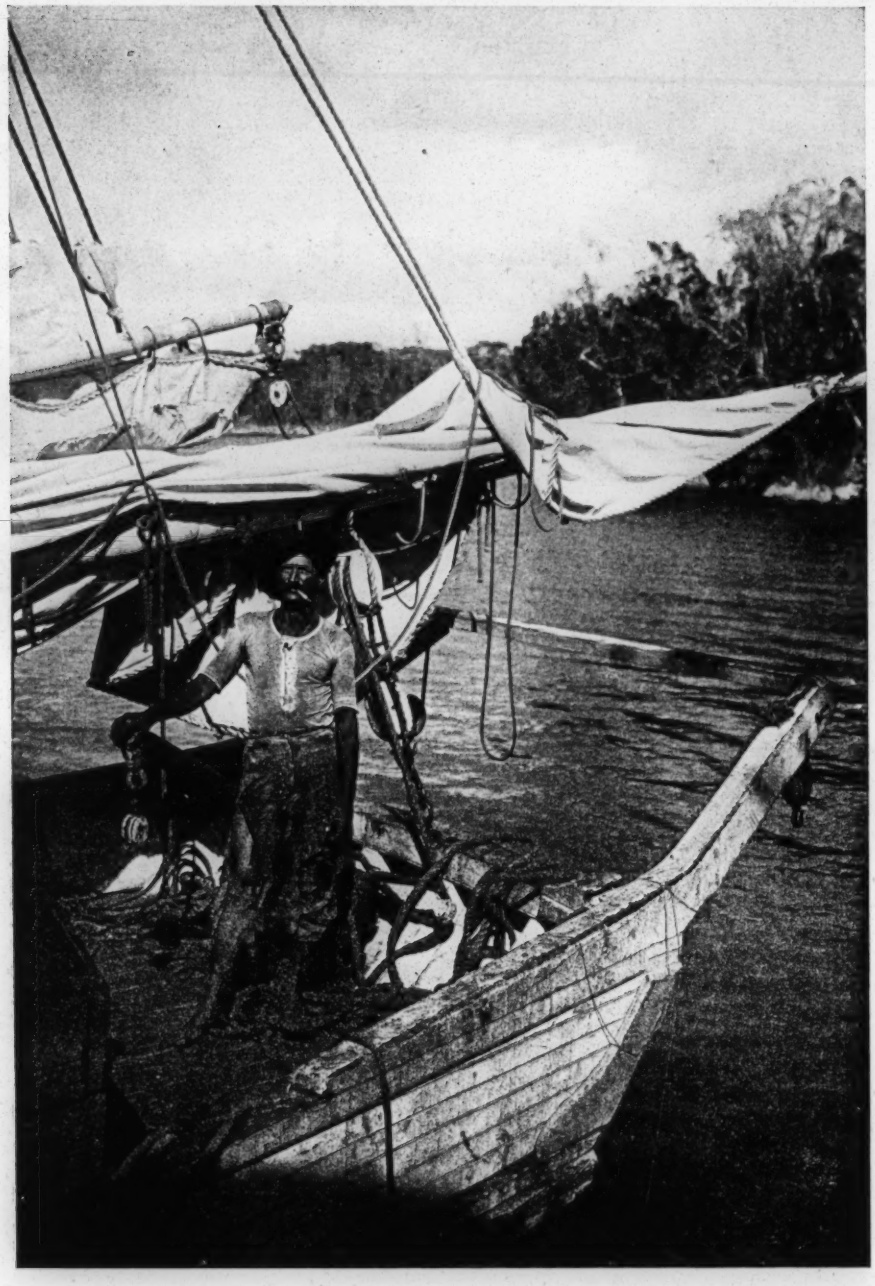


Photo by Walter D. Wilcox

SEMI-PIRATICAL SEA CAPTAIN OF A TRADING SCHOONER ON THE SOUTH COAST OF CUBA

Most of the traffic between small settlements on the south coast of Cuba is carried on such craft

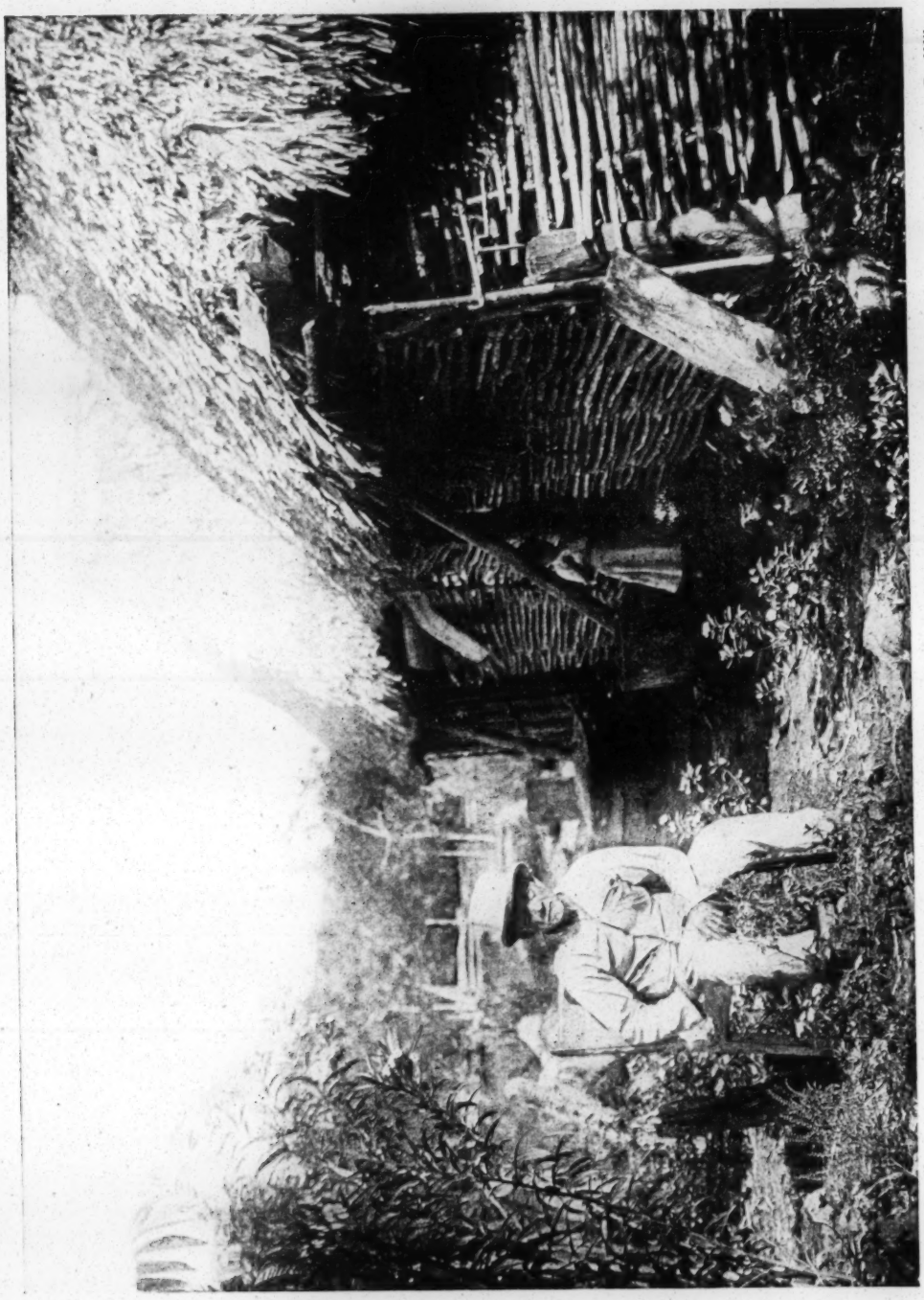


Photo by Walter D. Wilcox

OLD MAN AND A TYPICAL NATIVE HOUSE: COCHINOS BAY, CUBA

scent of countless blossoms. The majagua tree, famous for its green wood and fibrous bark, from which the strongest ropes are plaited, is brilliant with tulip-like blossoms of fiery red color; the baria is hung with masses of white, and the roble, the so-called Cuban oak, is adorned with clusters of delicate pink and white flowers, resembling the mountain rhododendron. The dull hum of honey-bees tells of the harvest of nectar, and at this season the natives are kept busy pressing honey and melting wax.

The variety of birds is very great at this period, as the Florida species, driven south by the cold of winter, have not as yet returned to the north, and the native birds are singing and mating. The Cuban crows call one another with a great variety of peculiar sounds and modulations, which one could easily fancy to be a kind of conversation among themselves, and the parrots come in noisy flocks of several hundreds and drive away by their loud chattering all thought of sleep after the earliest trace of dawn.

Emerald-colored humming birds dart from flower to flower on the gaudy hibiscus bushes or poise in midair amid the pink clusters of the coral vine. Many of the wild birds are sociable, and I have seen four or five different kinds at one time on or near the verandas of the house.

MISERABLE POVERTY OF THE FEW NATIVES

The natives of this region are a mixed race, rather dark in color and with a probable mixture of considerable negro blood. They live in miserable houses thatched with palm leaves, generally without windows or other protection from insects and weather. They are excellent woodsmen, handling the axe and machete with great skill. They think nothing of walking ten or fifteen miles on the most trifling errand. Many have small clearings where they raise bananas, yucca, and a kind of sweet potato. These fruits and vegetables, together with their live stock and beehives, eked out by the results of hunting and fishing, give them an uncertain and miserable diet. When they are fortunate enough to get work, they buy provisions; but a little stock in the cupboard is a temptation to quit working at once. It would be difficult to find a lower standard of diet and general living outside of savage tribes.

From lack of care and cleanliness, the teeth of these people decay and fall out before middle age, and their monotonous diet causes suffering from digestive troubles. Like all Cubans, they are very fond of pets, and it is no uncommon thing to see all the ordinary animals of the barn yard—goats, pigs, turkeys, chickens, etc.—wandering at will inside their houses. On an iron hoop suspended from a rafter a tame parrot may usually be seen, while many houses have a kind of rat-like animal, called the "jutia," which lives in the forest trees, tied up as a half wild and treacherous pet. Naked children sprawl about on the floor and many dogs, in a state of extreme emaciation from continued starvation, howl at every passer-by and add to the general misery. Were it not for the balmy temperature and the continued sunshine and general cheerfulness of the Cuban climate, these people would rapidly become extinct. In such hovels, abounding in filth and squalor, one meets with evidences of genuine hospitality in marked contrast to the surroundings. The stranger is invited to enter, offered the best chair, and coffee is prepared at once. Cuban coffee is roasted in small quantities and ground just before making. A cloth bag holds the ground coffee while hot water is filtered through it several times. The resulting coffee, while strong and excessively roasted, has a very fine aroma and flavor. Rather than be deprived of his coffee and cigarettes, a Cuban would prefer to go several days with little or no food.

In the huts of these humble people great formality, an inheritance from the Spanish, is observed on arriving and departing. Withal there is general ignorance, few being able to read or write, and their life is woefully monotonous, though they seem light-hearted and happy, prattling for hours about the most trifling

events in their daily life. They observe frequent holidays in connection with church festivals, birthdays, etc., and delight in dancing and music, the latter being barbaric and showing strong evidence of African origin. They believe that the moon has a great effect on the planted seed, and sometimes one sees an umbrella carried at night to ward off the evil effects of moonlight.

CHARTING COCHINOS BAY

A systematic survey with plane-table and alidade was made, with the purpose of preparing a chart of Cochinos Bay. All the preliminary work was done in a sail-boat, which proved a very tedious and uncertain method of working. Later, a motor boat was used, without which it would have been impossible to make systematic soundings. It was necessary to traverse every part of the coast on foot, and as the entire east coast is a rocky ledge, worn by the elements into a rough slag-like surface, called "diente de perro," or dog's-tooth coral, sometimes no more than a quarter mile could be charted in a day's work.

Three rivers enter the bay, besides several small streams. The larger rivers are in every case the mouths of underground streams, which drain the swamps and, breaking out near the coast, run the last part of their course in open rivers, called "caletas," which are deep-water inlets or coves. These are filled with salt water, as the tide enters and even penetrates underground and makes the water brackish more than a mile inland. Only in the height of the rainy season, when for several months the current has a velocity of four or five miles an hour, does the water in these "caletas" become partially fresh. The largest is Caleta Rosario, on the east coast of the bay. It is half a mile long and from 150 to 400 feet wide, with a minimum depth of over six feet, thus providing a safe refuge in stormy weather for small schooners.

REMARKABLE DEPTH OF COCHINOS BAY

As existing charts do not show the depth of water in Cochinos Bay, considerable time was spent in gathering sufficient data to make the work fairly complete. A wooden reel with sounding line was made and the first sounding taken one-quarter mile west from Caleta Rosario. The entire line, 900 feet in length, was run out without reaching bottom, and this surprising depth necessitated making a stronger apparatus and considerably reduced the number of soundings finally taken.

When it is remembered that all the surrounding land for probably forty miles in every direction is a level plain, ten or fifteen feet above sea-level at most, the great depths of this bay are remarkable. At one point, about the middle of the east shore, only one-third of a mile from the land, a depth of 1,245 feet was discovered. No soundings were attempted in the middle of the bay, as the great depth of water resulted in a resistance on the sounding apparatus that made the work impracticable. From an analysis of the soundings made, it seems probable that the greatest depths will be found to reach 2,500 or 3,000 feet. If drained of water, Cochinos Bay would appear as a deep and comparatively narrow valley, with canyon-like and frequently precipitous walls on its eastern side.

About ten miles due south of the bay, there is a small island, called Cayo Piedra, with a lighthouse visible nine miles. From this point northwesterly to the west side of the bay there is a long line of shoals, which serve to inclose the bay from the effects of southwesterly seas. The deep-water entrance between these reefs and the east shore is 3½ miles wide, and only in times of southeasterly gales do heavy seas sweep into the bay; but even then their force is rapidly dissipated, till at the upper parts their influence is rarely felt. Great depth of water and coral rocks make poor anchorages, as a general rule; but with local knowledge of good ground or by use of fixed anchors, ships can ride out the severest gales in the upper part of Cochinos Bay as safely as in a completely land-locked harbor. There are no

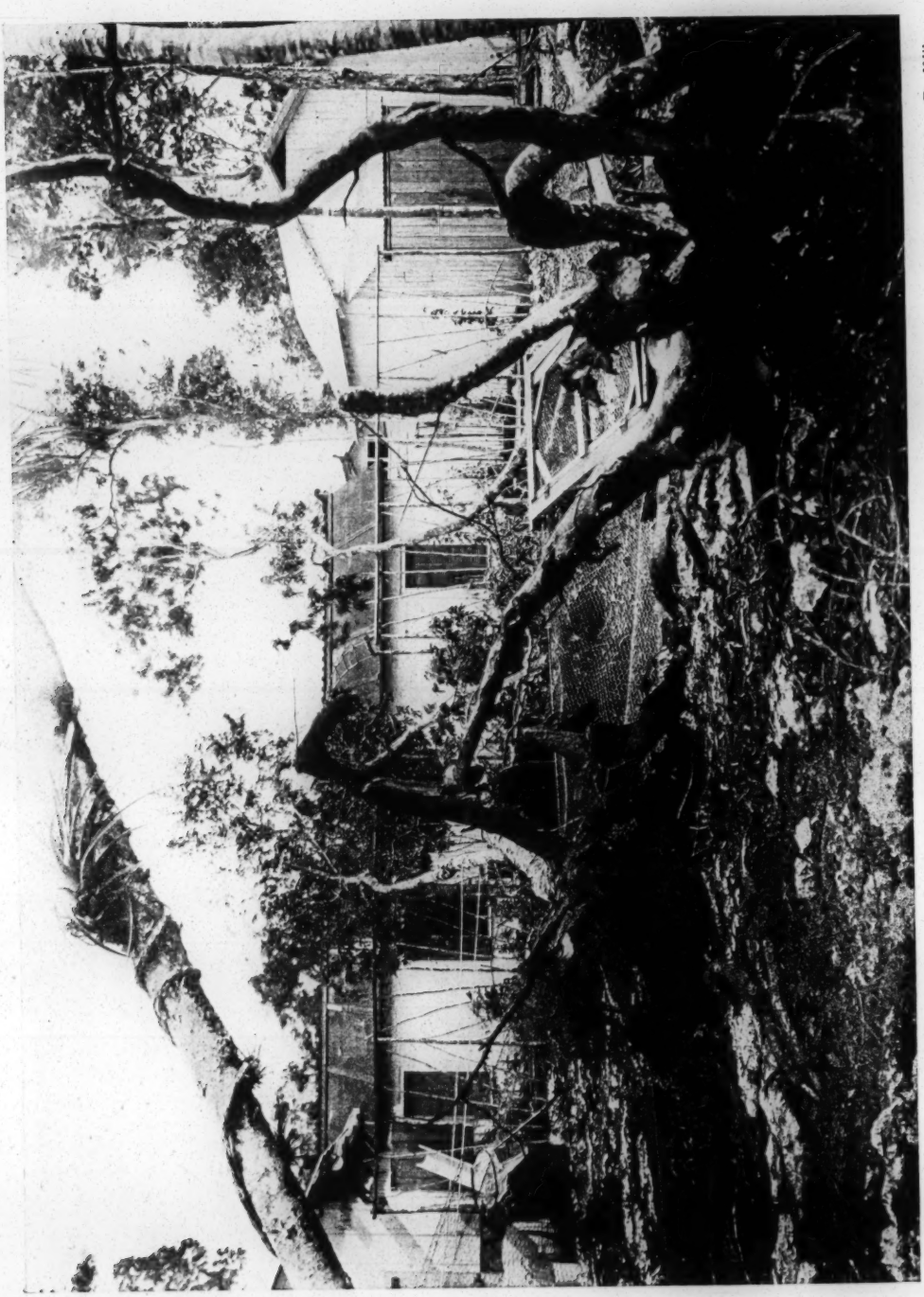


Photo by Walter D. Wilcox

THE DAY AFTER THE CYCLONE OF OCTOBER 17, 1906: COCHINOS BAY, CUBA

exposed rocks or dangerous reefs within the bay itself, except immediately adjacent to the shore, and ships can safely enter this bay on the darkest nights, hugging the east shore within 100 yards if necessary, in perfect security.

A simpler way of getting an idea of the depth of water in Cochinos Bay would be to imagine the water level to fall 25 feet. This would hardly change the position or form of the east coast. The west shore, however, would advance about a quarter of a mile at the upper end of the bay and gradually increase to two miles at Punta del Padre, and then run ten miles seaward in a southeasterly direction to Cayo Piedra, making the west coast about twenty-five miles in length. The bay would then appear a very long and narrow, almost land-locked, body of very deep water. The tide averages less than eighteen inches. West of the south end of the bay there are vast lagoons, with innumerable small islands entirely covered with mangrove trees. The water varies from eighteen inches to several feet in depth, and my launch being of light draft, it was found practicable to explore these island seas without difficulty. Charts do not correctly show the great extent nor true form of this interesting region.

WONDERS OF TROPICAL MARINE LIFE

Among the beautiful shells of the west-coast sand beaches were pieces of spongy volcanic rock, purple and green in color, which may have had their origin in the eruptions in Martinique.

As may be imagined, the water in this deep bay is of the utmost purity and clearness. The color is blue, rivaling that of the Mediterranean, and the bottom may be clearly seen in forty or fifty feet of water. The wonders of tropical marine life afford a never-ending source of delightful study. On bright, calm mornings one can look down through fathoms of crystal water and see the sunlight sparkling on snow-white beds of coral sand. Among branching corals, Neptune's cups, sponges, and purple sea-fans, fish of many strange forms and colors may be seen gliding to and fro, apparently within grasp of the hand—the blue llora, the red and green parrot-fish, the red-snapper, and the spotted cherna. On moonlight nights, moving rapidly through the water in a launch, one feels as though sailing over an enchanted sea of crystal, where every ripple is faintly outlined with phosphorescent fire.

The bay is a fisherman's paradise. The rapacious and dangerous picua is caught by trolling from rapidly moving sailing craft, but still fishing in deep water gives better results. Sharks often bite fish off the hooks before they can be landed, unless the line is taken in rapidly. Sea turtles of several varieties and the shell-bearing tortoise abound, the Cuban tortoise-shell being the most beautifully variegated and high-priced in the world. Sometimes the water surface for an acre in extent may be seen disturbed by a violent commotion of terrified and struggling fish when pursued by some larger enemies. Hundreds of sea-gulls add to the confusion, darting down on the water and catching the fish in midair.

A DELIGHTFUL CLIMATE

The climate is similar to other parts of Cuba, which is supposedly the most delightful of any within the tropics. The maximum and minimum temperatures at Cochinos Bay for nearly two years were 96° and 48°, the nights never being over 80°. The dry season lasts from November to May, and is characterized by nearly continuous sunshiny days. There is a popular misconception of the tropical rainy season as it obtains in Cuba. Rain may fall at any time of the year, even in the dry season, but, on the contrary, the rainy season is often interrupted by long periods of dry weather. The wind comes off the land at night, changing in the forenoon to the "virazon," or sea breeze which increases with the sun's heat, and is succeeded by calm at sunset. Thunderstorms are short and violent and often accompanied by heavy squalls. In June, 1906, more than seven inches of rain fell in a single night; but such excessive precipitation is rare.

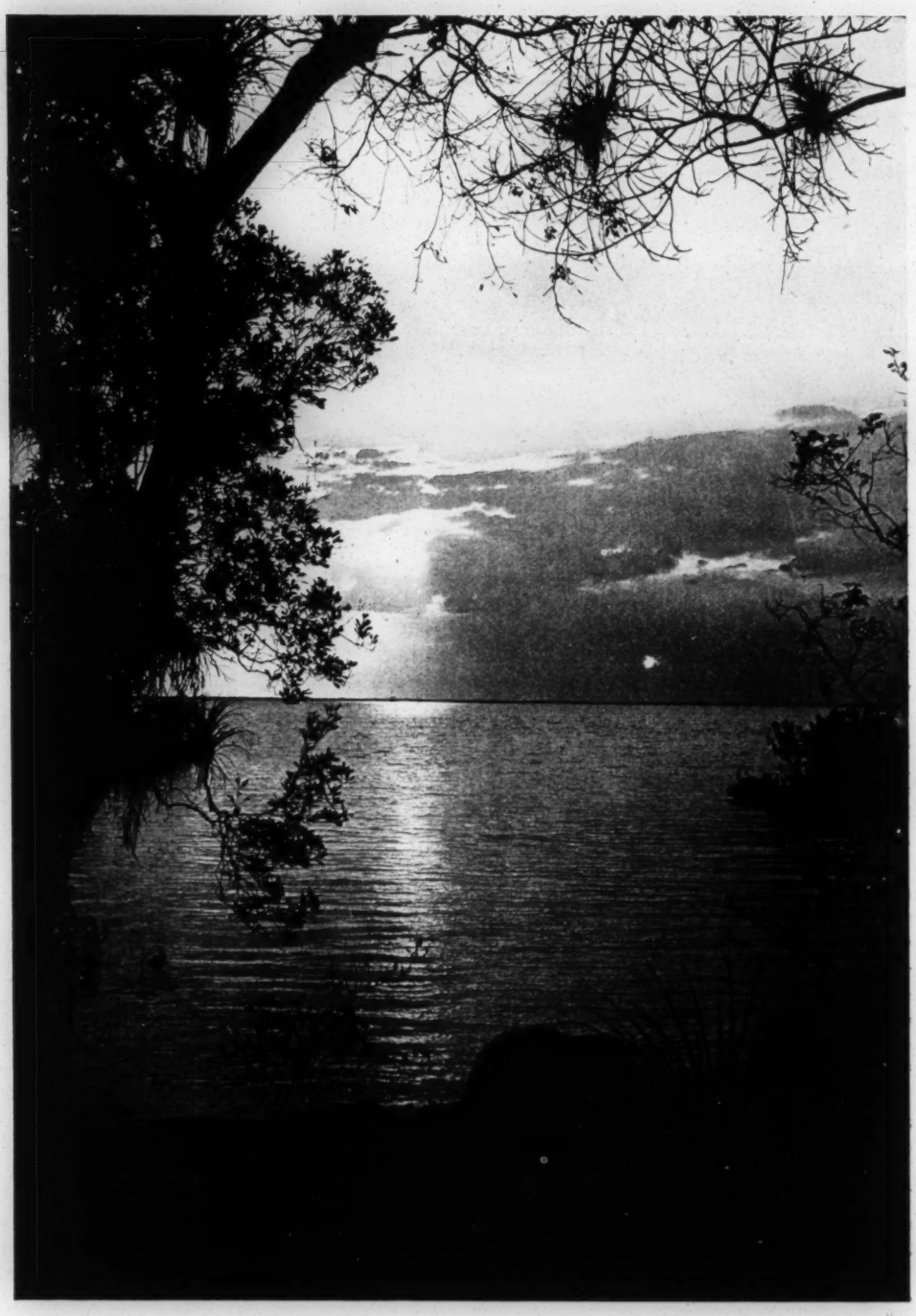


Photo by Walter D. Wilcox

A SUNSET ON COCHINOS BAY, CUBA

The afternoon thunder-storms, attended by a sudden fall of fifteen or twenty degrees in temperature, are followed by sunsets of marvelous splendor. The glories of tropical sunsets depend on an arrangement of clouds and an association of colors quite unknown to the temperate regions. The sun is surrounded by a soft and rosy glow, the entire heavens, even to the eastern horizon, is illuminated by pink clouds, and the western sky becomes an inspiring picture, built up of reddish brown and purple colors, warm in tone and typical of the tropics. The effects are kaleidoscopic and marvelous beyond description. Great masses of cumulus clouds, still showing the distant glimmer of lightning, are sometimes thinly veiled by intervening light showers of rain, through which their gorgeous colors are softened and transformed into visions of pearl and opal.

HURRICANES

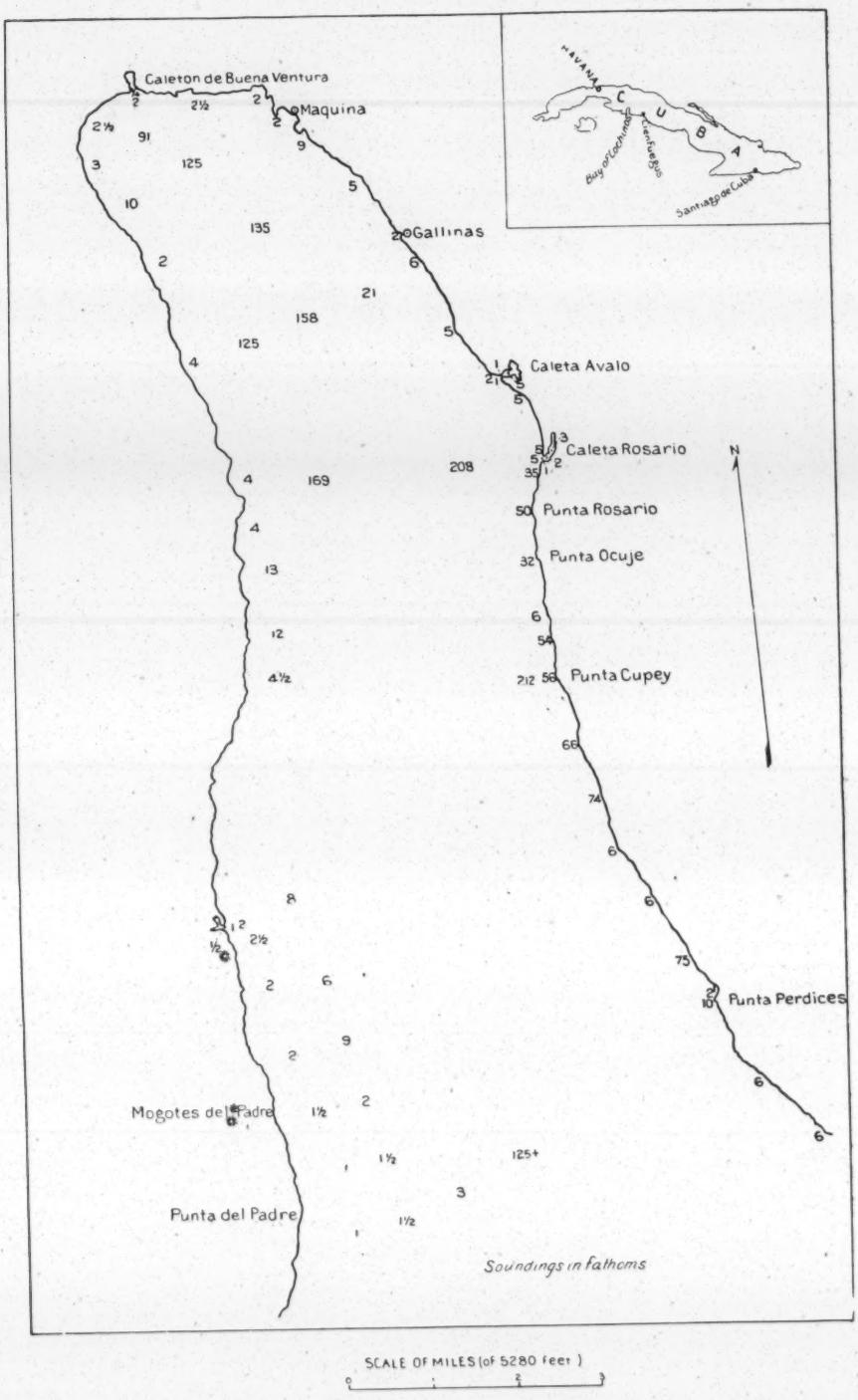
Hurricanes are most frequent in September and October. The last hurricane occurred October 17, 1906, the center passing not far west of the Bay of Cochinos. After a slow fall of the barometer for five days previous, the morning of the 17th was heavily overcast, with the wind southeast and occasional squalls of rain. About sunset the barometer began to fall rapidly and alarmingly. Five or six schooners took shelter within the Caleta, their captains wisely suspecting foul weather. The wind increased in force, till at nine o'clock the crash of broken branches and falling trees could be heard above the roar of surf on the bay, which was a mass of phosphorescent foam in the darkness. The barometer foretold an approaching climax, and though the house was very low and surrounded by forests, it seemed best, about midnight, to put out all lights and seek shelter among some rocks near the Caleta.

Fortunately the rain had ceased, it being a "dry" cyclone, which the natives had told us were the most severe, and the only danger was from flying branches and falling trees. Meanwhile the gusts came in ever-increasing fury, the forest roared in a subdued monotone and the trees were dancing wildly, waving their branches like angry demons in the fury of the gale. About one o'clock the barometer suddenly began to rise, a few stars appeared amid wisps of flying scud, and we knew that the center of the storm had passed, but nearly a hundred trees were uprooted around my house. This hurricane did the most damage in Havana and at Batabano, where it drove sixty schooners and steamers on shore. Such severe cyclonic disturbances are less frequent in Cuba than in other islands of the West Indies and are only expected once in five or six years.

Generally speaking, navigation is quite safe on this coast, though the forty miles between the bay and Cienfuegos is an unprotected shore, against which the heavy surges of the Caribbean thunder terribly in southerly gales. Westward toward Batabano and the Isle of Pines the presence of innumerable islands gives ample protection at all times.

Such in general are the more important features of the Bay of Cochinos. From five to ten schooners arrive and depart every week, engaged in the transportation of timber products and charcoal. The future depends entirely on railroad connection with the interior. Less than twenty miles separates the bay from railroads already constructed, and if this intervening stretch, which is only partly swamp land, can be traversed, the prospects for a considerable commerce is assured for Cochinos Bay. These swamps could probably be drained by a canal 3 miles long, 6 feet deep, and 180 feet wide. Cheaper freight and better docking facilities than in the shallow waters of Cienfuegos harbor would induce large shipments of sugar from the southern parts of Matanzas province. If, in addition, a canal to drain the swamps is constructed, a vast extent of fertile land will be uncovered and the rapid growth of a port is assured.

Notwithstanding the general flat and swampy nature of the region to the west



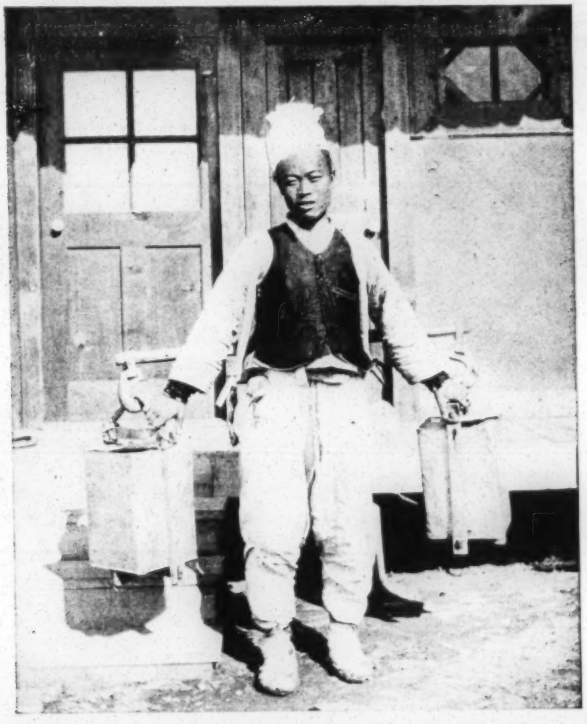
MAP OF BAY OF COCHINAS FROM SURVEYS BY WALTER D. WILCOX, 1907–1908

and north of Cochinos Bay, this district is remarkably healthful. Several Americans have camped out in the heart of the swamps, drinking the water unboiled for considerable periods of time, without a single recorded case of fever. The swamps are not stagnant, being fed by springs and drained by innumerable underground streams. Much of the land, aside from its great timber value, when finally cleared will be found adaptable to the culture of tobacco and other products, especially the several varieties of citrus fruits.

NOTES AND SCENES FROM KOREA

SOME interesting information has recently been sent to this country by American Consul General Thomas Sammons, of Seoul, about what the Japanese are doing in a practical way for Korea.

A model farm and agricultural college was started by the Japanese at Suwon, 25 miles from the capital of the country, and has just been transferred to the Korean government. The buildings are commodious and well built and equipped with physical and chemical laboratories of most modern description. Large dormitories were erected for the Korean students, but the consul reports that these dormitories had to be heated in the Korean manner, beneath the floors, before any students would attend. Experiments such as are carried on at our best American agricultural stations will be conducted.



A missionary's water-carrier in Pyengyang, Korea. There are no wells in Pyengyang City, as old Koreans said the city was a boat and would sink if wells were dug. So all water is carried by water-carriers from one of the rivers on either side. Photo by J. Z. Moore.

In the nine months during which the station has been in operation it has experimented with sugar-beet, rice, cotton, barley, silk worms, mulberry trees, farm animals, rye, and wheat, besides serving as a meteorological station. It is thought that the experiments with cotton and silk-worms will open up a great future for the Korean farmers. It will take, however, many years before Korean silk becomes perfect, as the Korean mulberry leaf, the trees being large and uncultivated, gives a yellow color and crude appearance to the silk. However, as the mulberry tree was first introduced into Japan from Korea, and as many Japanese state that they can recall when Japanese silk was as crude as is the Korean product, they are hopeful for the industry. The experimenters find that tobacco grows better in Korea than in Japan, but the leaf does not come up to the high American standard.

The Japanese authorities have also passed new Korean forest laws similar to those of Japan. In many parts of the country there are splendid forests, but in

other sections the woods have been entirely cut away. In these sections, it is claimed, Korea suffers from disastrous floods as terrible in their ravages as those in China. Coal mines are being hunted for and opened as rapidly as possible, which will also help preserve the forests.

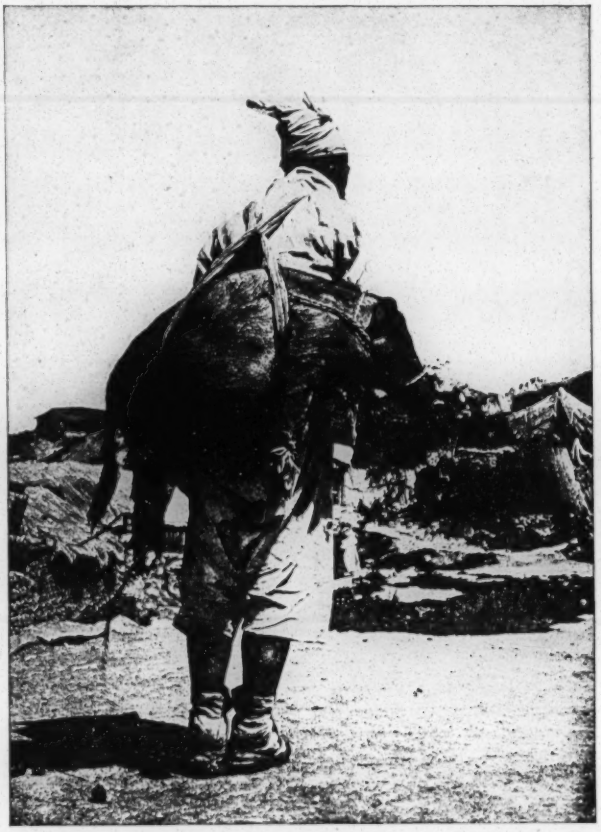
It is not generally known that Japanese forests have been managed longer than any of those in Europe. They were controlled before the birth of Christ, and during the early Christian centuries forest planting on watersheds to prevent floods was enforced by frequent edicts, and the felling of trees was supervised by officers of the provinces. As a result, Japan alone among the nations began modern industrial progress with its forests not only unimpaired but improved after centuries of use. About 59 per cent of its total area is in forests of which the state owns considerably more than one half.

China, on the contrary, has persistently destroyed her forests, with the result that its hills have been largely stripped clean of vegetation and the soil is almost completely at the mercy of the floods. In the lower mountains of northeastern China, where the stripping process has reached its extreme phase, there is no trace of anything worthy of the name of forest. In the graveyards and courts of the temples a few aged cedars have been preserved by the force of public opinion, and poplars and fruit trees planted about dwellings are protected as private property by the peasant owners.

In the province of Shantung, where deforestation is practically complete, fuel and fodder for cattle are literally scratched from the hillsides by boys who go out from villages with their iron rakes in autumn to secure winter supplies. Grazing animals, searching every ledge and crevice, crop the remaining grass down to the very roots.

In western China, where forest destruction is not yet complete, enough vegetation covers the mountains to retard the run-off of the rains and return sufficient moisture to lower levels, where it can be reached by the roots of crops.

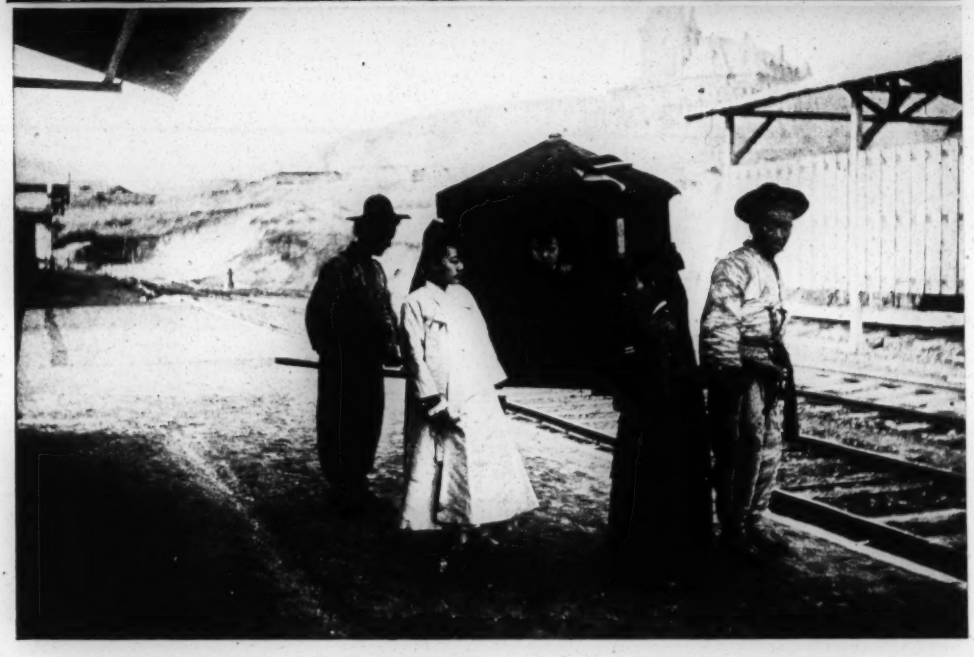
Mr Sammons says that the Koreans have been greatly impressed by the American electrical machines, and that they are adopting all kinds of modern electrical appliances, such as fans and motors and electrical fixtures.



Most of the carrying in Korea is done by men. Often 300 and 350 pounds are thus borne. Mr E. D. Follwell, who sent this photograph, writes: "I have seen men, and once a woman, carrying two pigs at a time on the back as they went to market."

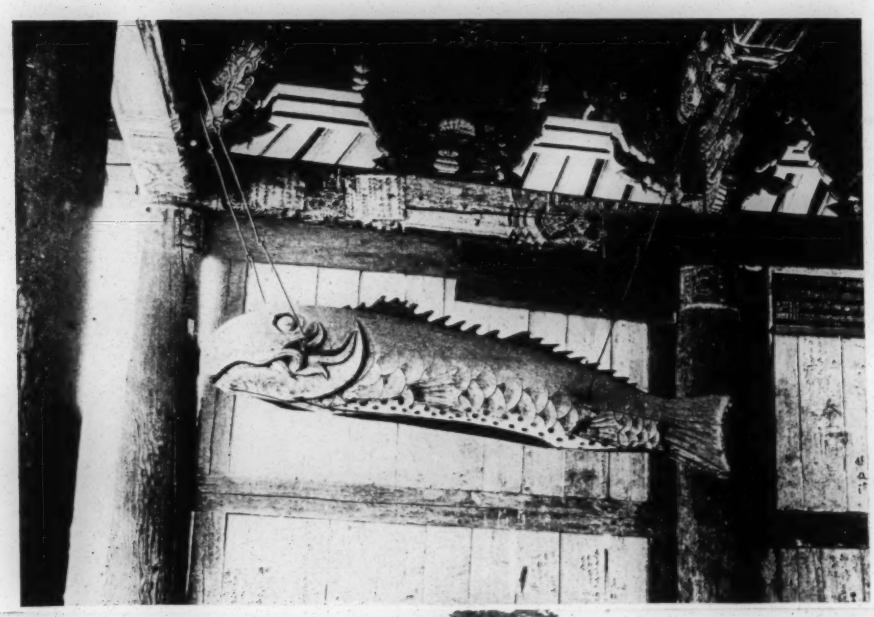
A WAYSIDE SHRINE JUST INSIDE THE SEVEN STAR GATE, PYENGYANG, KOREA

These shrines are becoming fewer each year. Photo from J. Z. Moore



A KOREAN BRIDE IN CHAIR

The bridegroom, dressed in black, stands at the right; on the left stands the go-between, in white. Photo from Bishop M. C. Harris

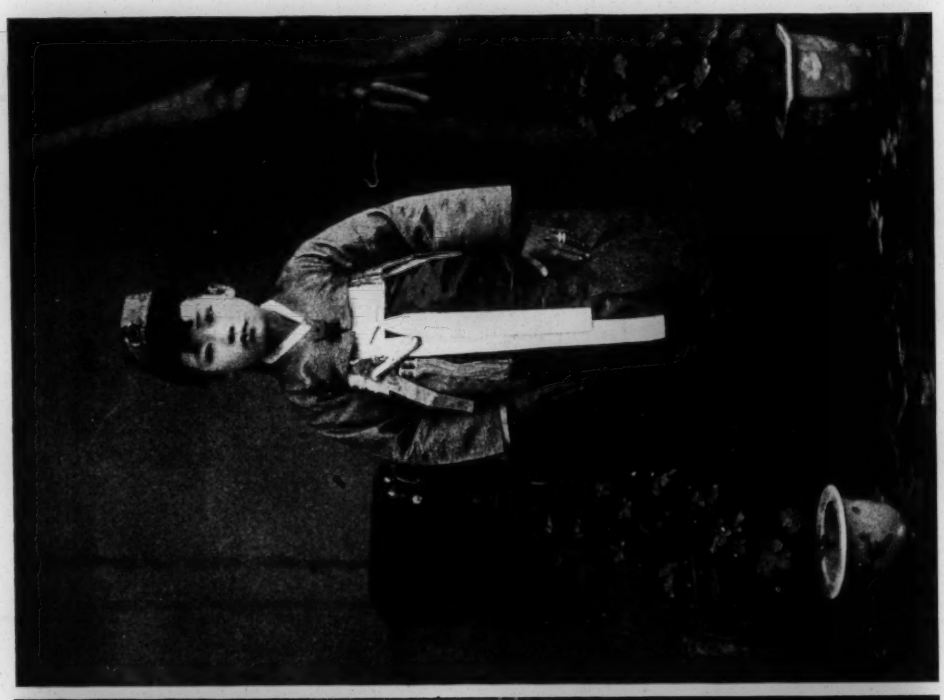


BUDDHIST FISH INSIDE MONASTERY AT HYANG SAN, NORTH KOREA

Sacrifice is made to this wooden image to protect the spirits of the departed who died from drowning. Photo from E. D. Follwell

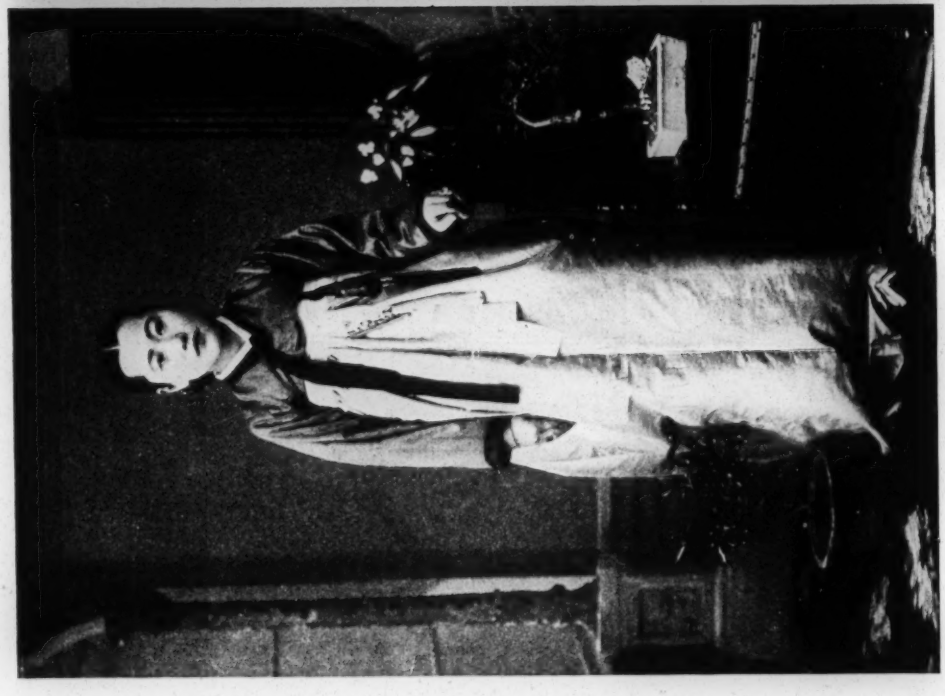
A WISHING STONE

The stone, inside of which is the image of a child with the head off, is turned around by those women who want sons, and is also turned around many times that long life may be given to sons already born. At a temple just at north end of Pyengyang, Korea. Photo from J. Z. Moore.



Photos by Bishop M. C. Harris

A KOREAN YOUNG WOMAN



A KOREAN LADY OF THE COURT

KOREAN FATHER AND TWO CHILDREN

Prince Yi, cousin to the ex-emperor who abdicated in 1907. Photo from Bishop M. C. Harris

Photo from Bishop M. C. Harris

STONE CARVING SYMBOLIZING LONG LIFE: SEOUL, KOREA

BOYS OF HEATHEN SCHOOL, KOREA

They use sand boxes in place of slates. In the study of Chinese characters, they make the character in the sand with a stick, then shuffle box and make another character. Photo by David E. Hahn.

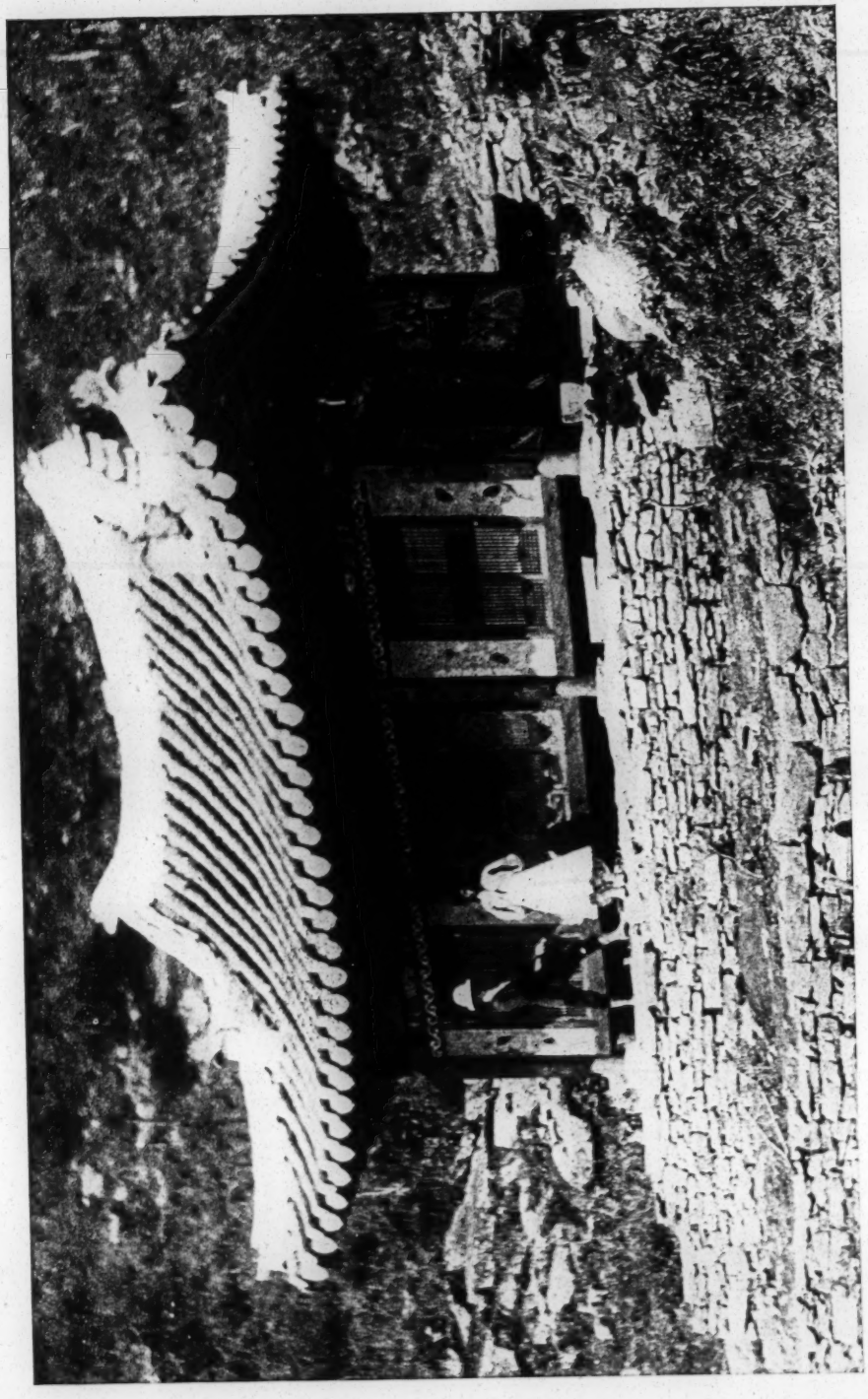
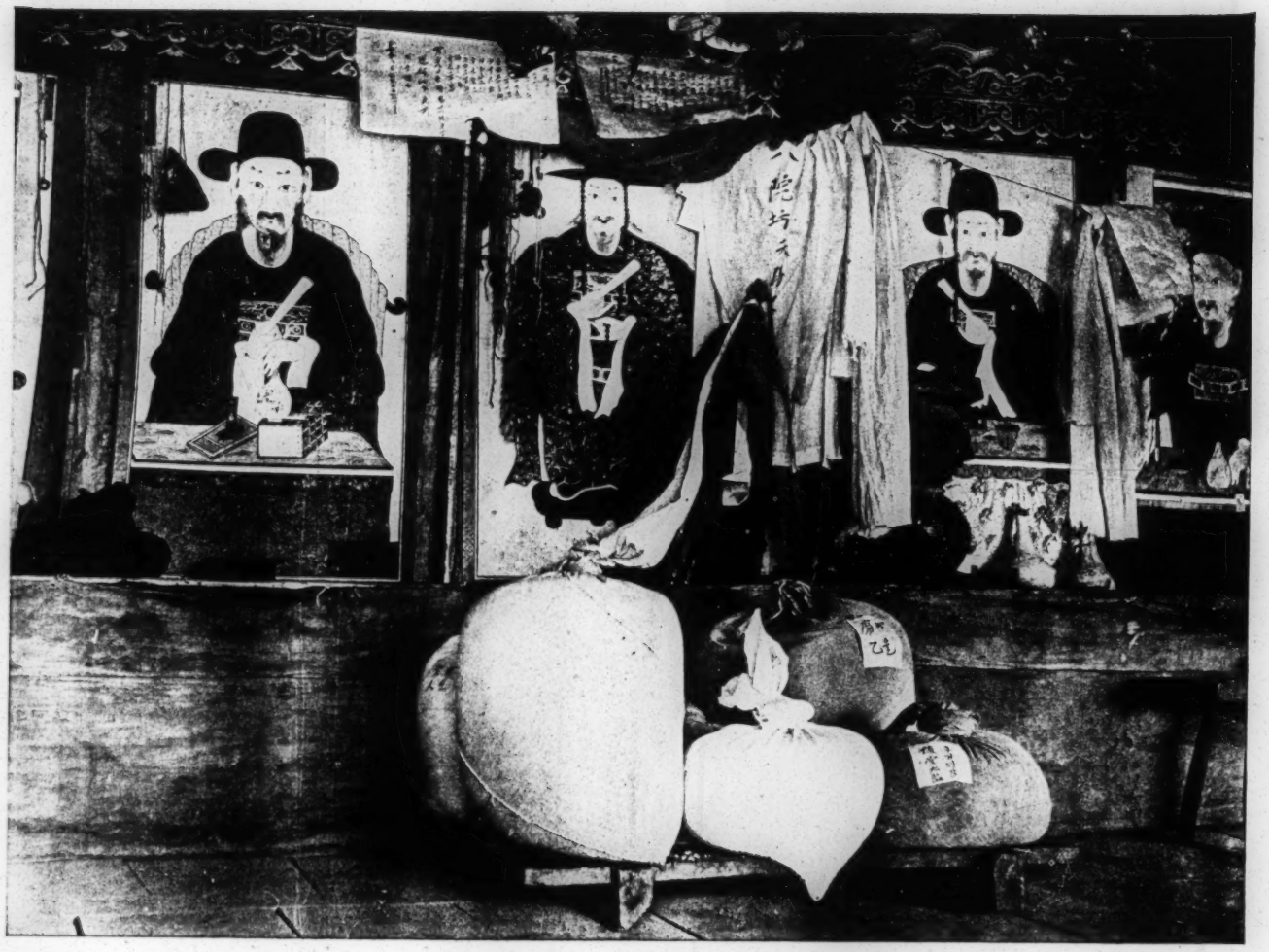


Photo by D. E. Hahn

DEVIL HOUSE NEAR THE ENTRANCE TO YENG BYEN, KOREA



INTERIOR OF DEVIL HOUSE

Scattered here and there through the northern part of Korea, are these little Devil Houses, erected for heathen worship. The picture represents the spirits who rule over the destiny of the population of Yeng Byen City. The bags of corn and beans are offerings brought by devotees. Photo from E. E. Follwell.

PART OF THE GALLERY OF NAMES ON TOP OF YAK SAN (MOUNTAIN), YENG BYEN, KOREA

For ages people have come from long distances to have their names cut into these rocks. The scenery from the top of this mountain is very beautiful. Photo by Chas. E. Morris

SOME HUMAN HABITATIONS

By Collier Cobb

Professor of Geology in the University of North Carolina

A CHICAGO reviewer of my article on the work of wind along the North Carolina coast* pointed out that the traveler need not now go to Holland to see windmills, or to China to see wind-driven carts, or to Turkestan to see sand-buried cities. It is equally true that he may review the records of the past and examine into the arts of a remote antiquity without leaving his own land, without departing from his own coasts, if he is so fortunate as to be a dweller in the United States.

He need not go to Switzerland and study lake dredging to find how human habitations were once built upon piles by a race of dwarfs who wished to protect themselves from the dangers of the land and lazily gain a livelihood by fishing from their very doors. Nor need he seek the submerged remains of such dwellings in the lakes of Sweden, Italy, and Ireland.

Neither is it necessary for him to look to far-away Australia in the very recent past for the home of the bushman, which is hardly more than a nest in a hollow under a bush; nor to Central Africa for a half-concealed hut, such as a Batwa pygmy builds for himself of palm leaves. A journey of one thousand miles up the Nile from Khartum is not necessary in order to find the hemispherical hut made or straw-thatch or of carefully woven rushes, that home of so many of the savage descendants of primeval man; nor need the traveler visit tropical Asia, or the Malay peninsula, or the East Indies to accomplish this purpose. The highest type of straw-thatched gabled house, such as is used by the Kaffirs of Natal, may be found far short of the East Coast of Africa; nor is it necessary to visit our new possessions in the Pacific to find such a biding place for man.

Our American Indian still makes for himself a tepee from blankets of his own weaving, and the American of the Far North is sheltered through the long day by a somewhat similar tent covered with the skins of animals, though he burrows in the ground through the long winter night. These American tepees are not unlike the tent of camel's-hair or goat's-hair cloth that protects the Arab from the heat of the desert.

The Gaddanes of Luzon dwell in straw houses built in tree tops, and even the dwellers of King's Island spend their summers in cliff houses perched high upon poles. But the traveler needs not to visit our island wards, the aborigines of the West, or the Esquimaux and Aleuts of Alaska to find even these primitive dwellings.

All of these early types of human habitations may be seen strewn along our own coast from Cape Hatteras to Cape Sable, though they are of more common occurrence along the North Carolina coast than elsewhere. These are by no means the homes of half-savage men, but are the temporary abodes of modern civilized men, native to our own shores, when they engage in the half-savage occupations of fishing and hunting.

They are thus not survivals, but atavisms. Modern man finds himself in a situation practically identical with that of his savage ancestors, and he meets the conditions of existence in essentially the same way as the savage. Man, after all, is largely a creature of instinct, and the small boy of our day is not alone in his instinct of savagery. All of us like to return at some season of each year to the habit and garb of our primitive ancestors. With many of our dwellers by the

* Published in the National Geographic Magazine June, 1906.

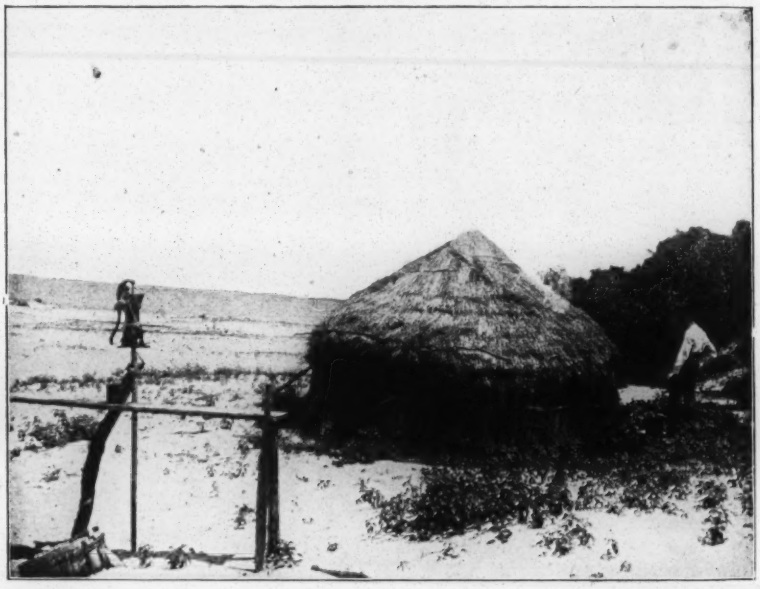


Photo by Collier Cobb

FISHERMAN'S KITCHEN: SHACKELFORD ISLAND, NORTH CAROLINA

sea this occasional has become the usual, and temporary habitations have become permanent, being kept in repair and used from season to season when hunting or fishing.

Our modern savage-from-choice has also the strong instinct for concealment, that characterized his savage forebears, as is shown by the fact that many men who dwell near the coast know nothing of these lodges. For example, I have visited hemispherical huts of woven rushes on Cedar Island, Core Bank, Shackleford Bank, near Tar Landing, less than a mile from Fort Macon, at the Rice Path, about the middle of Bogue Banks, and at the Carrott Island fishery, about four miles from Beaufort. On Cedar Island there is a large kraal with domed and conical huts of woven rush and with gabled thatches. Yet well-informed citizens of Beaufort and Morehead City know little or nothing of them.

In 1902 I took a boat-load of forty-two friends from Morehead City to the Shackleford lodge, not one of whom had ever seen or heard of such dwellings on the North American continent, though most of them had been regular attendants upon the sessions of the North Carolina Teachers' Assembly, at Morehead City, for a number of years. I cannot remember when this hut was built, but it has been in constant use for more than a score of years. It is not distinctly hemispherical, but is round at the bottom, with vertical walls, and its roof is rather conical than hemispherical. It is twelve feet in diameter and six feet in height. It has a door large enough to crawl through and a fireplace in the center, the smoke escaping by a hole in the apex of the roof. The rushes have been so thoroughly soaked in salt water as to be practically fire-proof.

Another case in point: A number of years ago I was wrecked on the Florida coast, and came upon a little key which had upon it one of these primitive habitations of palmetto thatch. I lost my camera in the wreck and consequently could not photograph it; but my kind host assured me that there were many such hid away in the thickets of the mainland

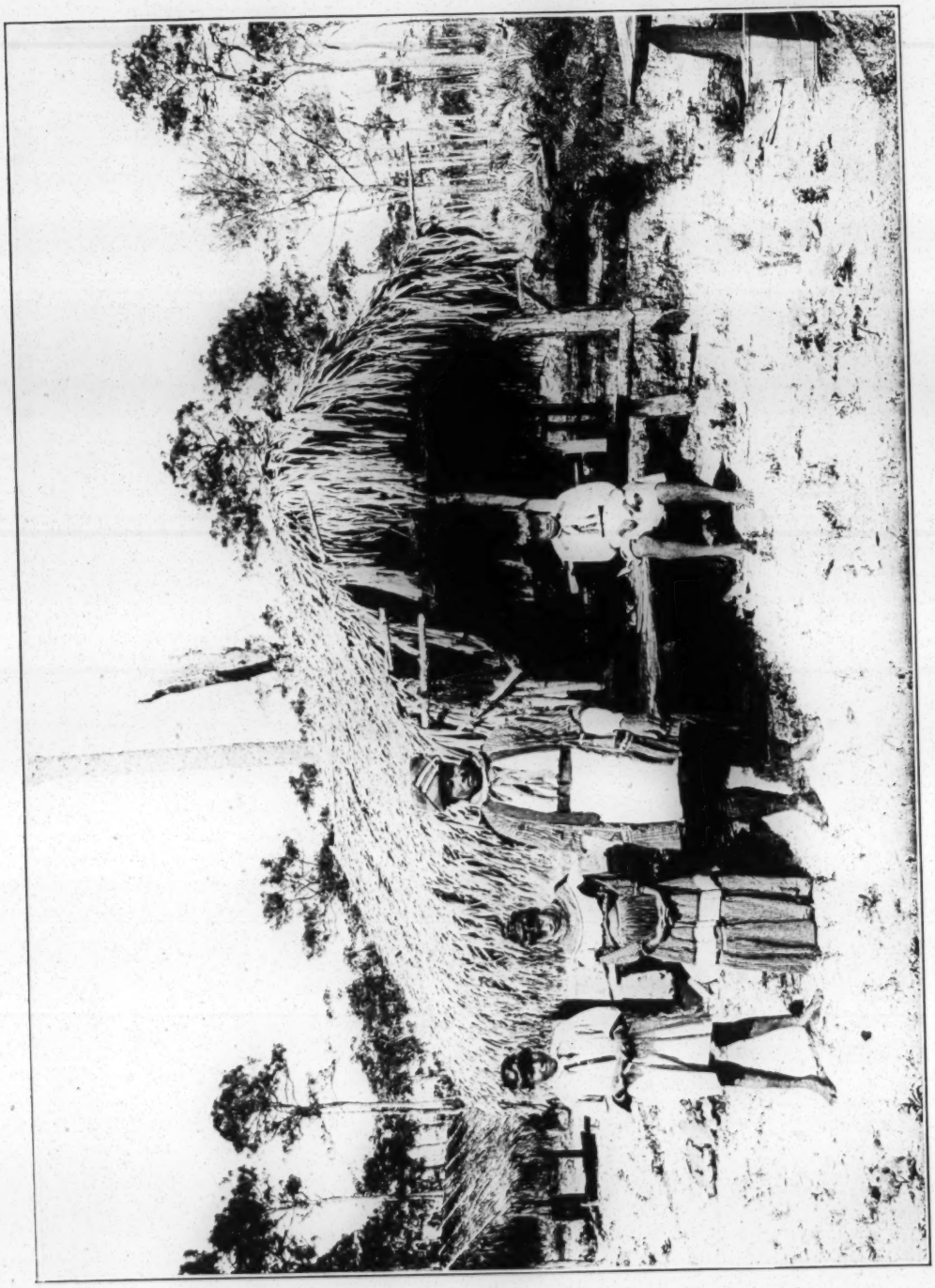
Photo from North Carolina Geological Survey

FISHERMAN'S CAMP: SHACKELFORD BANK, NORTH CAROLINA

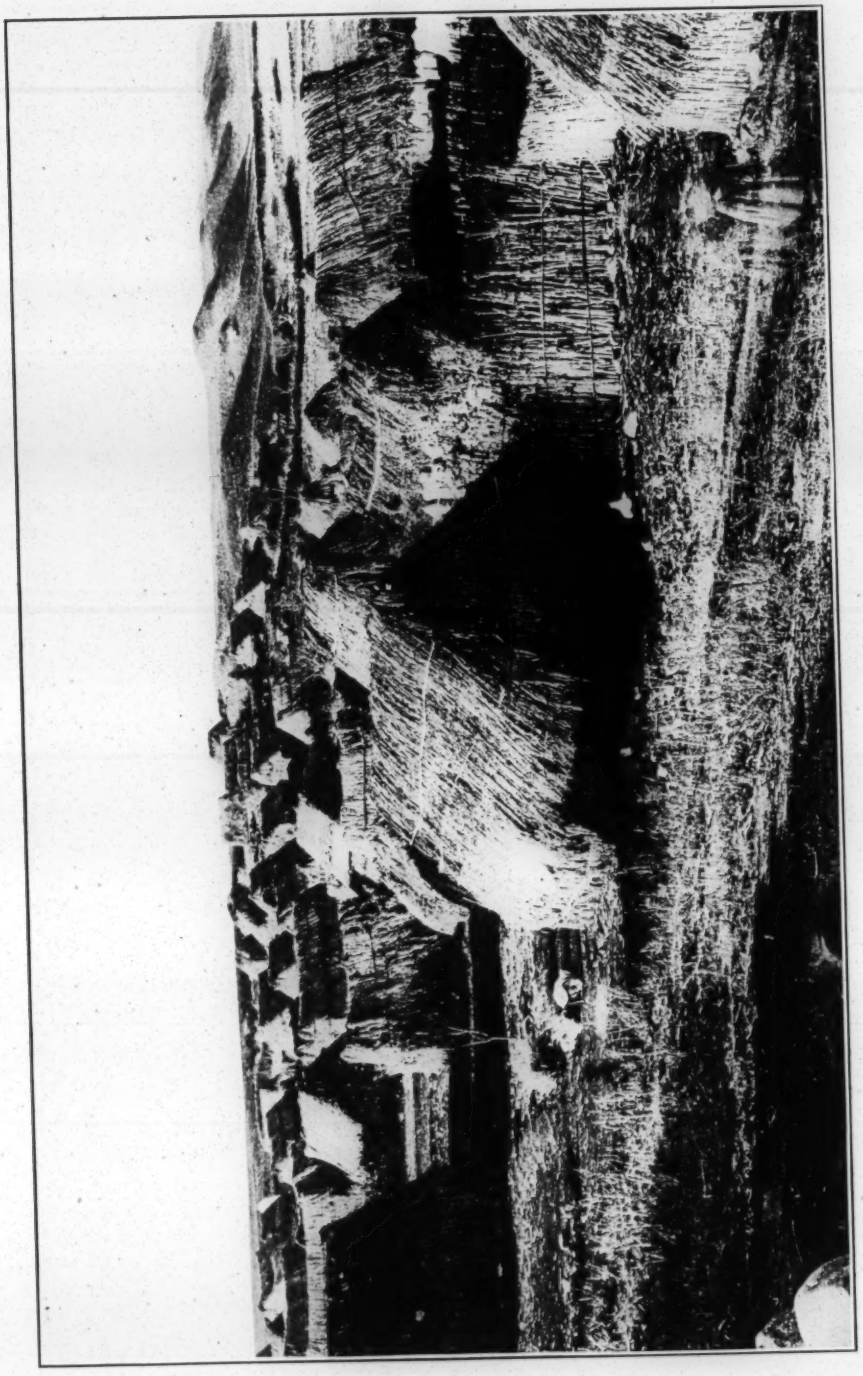
and upon the keys around Biscayne Bay, and that, so far as he knew, they were found all along the keys and the shoreline as far as Key West. Yet letters to several observant gentlemen, thoroughly acquainted with the coast, failed to get for me any information or photographs of such lodges, all of them assuring me that no such exist on the Florida coast. Yet another trial has brought me the desired photograph, the promise of several more, and the assurance that I may soon obtain still more, as the land south of Cocoanut Grove is being taken up by homesteaders.

The lodge in the tree-top, which was unknown except along the North Carolina coast, has largely disappeared with the disapperance of the great forests along "The Banks," as these sand-reefs are called. One of the earliest, and the first to disappear, was that at the Kill Devil Hills, which was used by the early settlers of the Albemarle district as a watch-tower when on the lookout for New England ships that brought Medford rum to the Carolinians in exchange for corn. Another was at Nag's Head, where the rude wrecker of Colonial days found it to his advantage to keep informed as to the movements of these same New England ships on their way to the West Indies for molasses and more rum. No old inhabitant of Hatteras has any recollection, or even tradition, of such a lookout there; but Blackbeard's piratical crew maintained a tree-top lodge in the great oaks near Teach's Hole, on the southwest end of Ocracoke Island. These all disappeared long before the days of our oldest inhabitant.

Southward from Ocracoke Inlet, such lookouts, as they were here called, have been known during the past half-century on Portsmouth Island, on Core Bank, near Cape Lookout, and near the western extremity of Bogue Banks, where they were maintained from early Colonial days



SEMINOLE INDIAN HOME NEAR MIAMI, FLORIDA



HARVEST HOMES AT GABII

GOAT HERDER'S HOUSE IN TEXAS

down to the disappearance of the forests, from forty to fifty years ago. I well recall a rush-built lodge on Bogue Banks, long used as a lookout for whales, which, its hoary occupant told me, had replaced a tall tree-top lookout of considerable dimensions.

While the great tree-top habitations have practically disappeared from the tall trees there, lookouts of less significance may still be seen where the tall pines come down to the water's edge along the western border of Currituck Sound, and I recall one such at Kitty Hawk. Within five years I have also seen them on Jew's Quarter Island, Bell Island, Church's Island, Colleton Island, and at several points on the Currituck marshes.

Straw-thatched lodges are also frequently built along this same western border, when trees do not afford the necessary height. They are no longer used by pirates and wreckers watching for their prey, nor by whalemen seeking big game in the sea. The laws permit hunting in the sound on only four days in the week, and these lesser tree dwellings are occupied by old hunters on Wednesdays and Saturdays, for here they may watch the passage of wild fowl.

It is in this region, too, that the hunter who expects to be away from home for a few nights only makes his nest of rushes under a bush and possibly throws around him an additional bush or two, or, perhaps, a few leaves from the fan palmetto, so abundant on Colleton Island. If he expects to spend some time in the neighborhood, he makes a low rude frame with bushes, covering it with brush or with palmetto leaves, after the manner of the pygmies.

It is also in Currituck Sound that the lake dwellings are encountered. These are not for temporary occupation, but are the permanent homes of their builders, who occupy them with their families all the year round. They are built on piles in the sound, which is now a living lake, as the entering streams have leached out the salt since the closing of the inlets that afforded communication with the sea. One such house I mentioned in my previous article as having been moved before an advancing sandwave and finally built on piles in the sound; but there are many others built originally as lake dwellings.

I recall one where the family occupied the top floor, the proprietor conducting a general store on the level of the bridge connecting him with the mainland, and carrying on an extensive business in the purchase and shipment of fish and game at the water-level underneath.

While somewhat similar lodges were found by the Raleigh voyagers to our shores in 1585, as is shown by John White's water-color drawings in the Grenville Collection in the British Museum, the circumstances seem to warrant the belief that these are atavisms rather than survivals. It is not so, however, in the case of the palmetto shacks of the Florida coast, which are clearly imitations of the homes of the Seminole Indians in their immediate proximity. These Indian lodges are furnished with a floor raised just high enough above the ground to admit the ever-present hog with his community of fleas. The lodge is rarely occupied except at night, and the platform is in reality a bed rather than a floor. The driven rain is usually kept out by mats and blankets hung around the walls.

Thus we see that men, however far removed from one another in time and space, instinctively meet similar conditions in essentially the same way. The shepherds who occupied the Palatine Hill in 753 B. C. built very much as the North Carolina Islanders do today; and Italian peasants of the present time build in the Pontine marshes or in the Agro Romano, when they come down from the mountains for the cultivation of their maize fields, houses essentially like those of the days of Romulus and Remus.

The prototype of these prehistoric contemporary settlements is the village constructed every autumn on the now drained lake of Gabii, at the twelfth milestone on the Via Praenestina, and inhabited by a half-savage tribe of two hundred mountaineers. The natives of New Guinea, the huntsmen of Borneo, and the fishermen on the Volga construct huts of essentially the same type.

IS OUR NOBLEST VOLCANO AWAKENING TO NEW LIFE

A Description of the Glaciers and Evidences of Volcanic Activity of Mount Hood

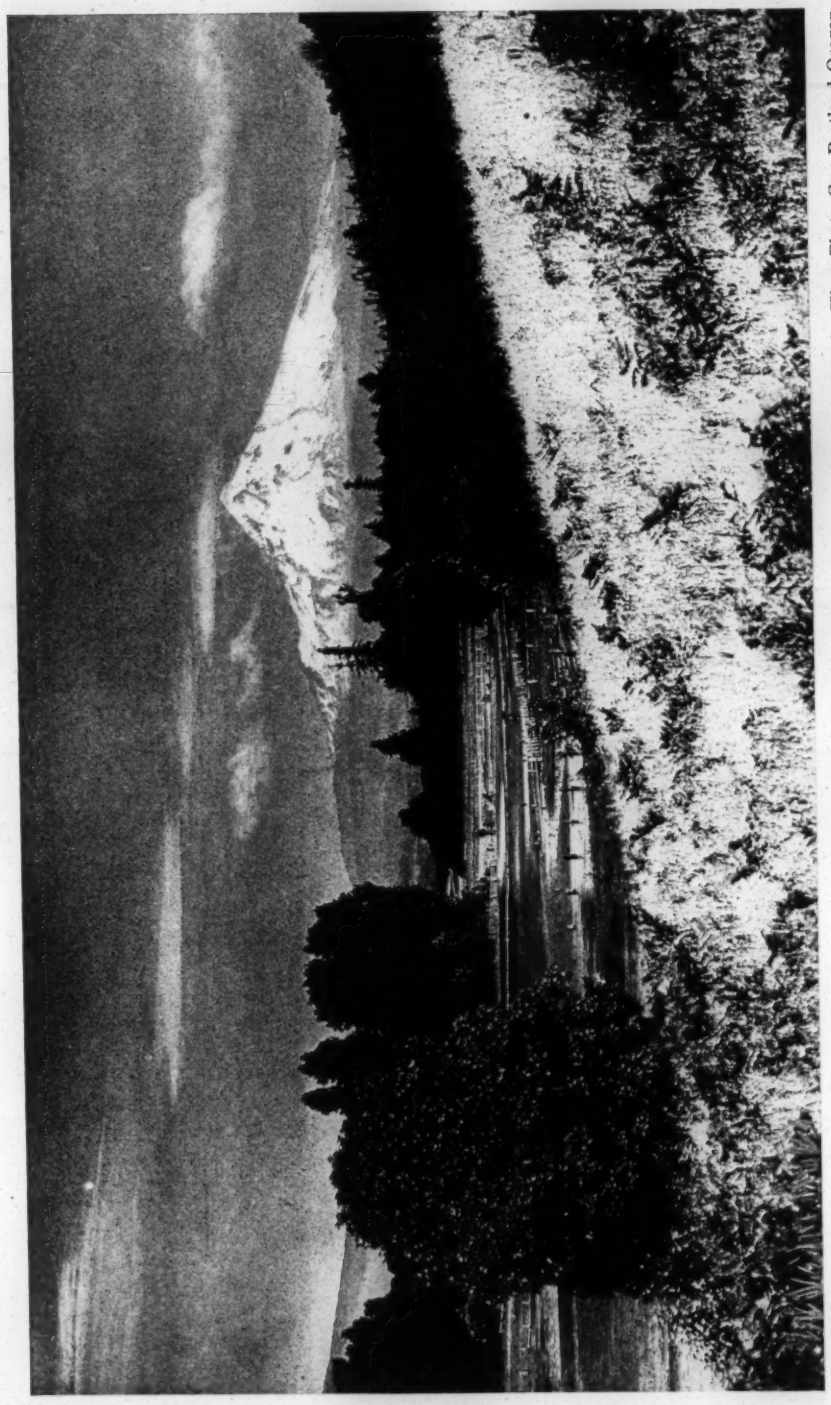
BY A. H. SYLVESTER

UNITED STATES GEOLOGICAL SURVEY

THE early immigrant to Oregon, while yet on the eastern sagebrush plains, if the day was clear, saw a great white mountain, like a specter, beckoning him ever westward. The sailors of an English exploring ship beheld, day after day, from the Pacific Ocean, the same great mountain, standing white and alone, high above the forest-clad hills that stretched to north and south. They gave to it the name of an admiral of their navy, and never has a man's memory been perpetuated by grander and more beautiful monument.

The Indians of Oregon venerated the great mountain and worshipped the spirit that dwelt therein. The immigrants soon gave to it a love as strong as the native's veneration; and justly, for over every one who comes within its dominion it casts the spell of its enchantment.

Having seen Mount Hood at various distances and from various directions, for



Copyright by Kiser Photo Co., Portland Oregon

MOUNT HOOD FROM SANDY RIVER BLUFFS: LOOKING EAST UP SANDY RIVER

twelve years, and having come under its spell, it was with pleasure that I received my orders from the U. S. Geological Survey, in the spring of 1907, to begin the mapping of the Mount Hood Special Quadrangle.

The latitude of the mountain is 45° 22′ 26″.74; its longitude, 121° 41′ 42″.81 west of Greenwich. It lies on the crest of the Cascade Range, about 20 miles south of the Columbia River and 50 miles east of the city of Portland. It is the highest point in the State of Oregon, rising to a height of 11,225 feet. This elevation was determined by Col. R. S. Williamson, U. S. Army engineers, at an early date, and was checked by me last summer.

Timber grows on and about the mountain up to an elevation of 6,500 feet. The highest trees are stunted hemlock and dwarf pines, which venture out from the denser forest along the straggling lines of the old moraines.

The waters of Mount Hood reach the Columbia mainly through the Hood and Sandy rivers and their tributaries. Hood River drains the northern and eastern sides; the Sandy, the southern and western. White River, which receives the drainage from one glacier on the south side, is a tributary of the Deschutes, which reaches the Columbia above the Dalles. At low water the flow of these streams, according to the measurements of the Hydrographic Branch of the Survey, amounts to about 750 second-feet—enough water to cover in a year the District of Columbia about 160 feet deep!

AN ALMOST PERFECT VOLCANIC CONE

Mount Hood is one of the great volcanic cones built upon the Cascade peneplain in Miocene times. It is the fourth in height of the snow peaks of the Pacific Northwest, being surpassed only by Rainier, Shasta, and Adams. The peneplain-like plateau upon which it stands is now well dissected, but the numerous remnants show a fairly uniform elevation of from 4,000 to 4,500 feet. The mountain rises, therefore, about 7,000 feet above the surrounding country. It was probably never much higher than at present.

Though showing many of the features of the volcanic cones of the region, it has enough peculiar to itself to give it a marked individuality. With the exceptions of Saint Helens, in Washington, and Pitt, in southern Oregon, its cone is more nearly perfect than the others. It appears to have been built up entirely of andesitic lavas which were ejected from a single summit crater. Unlike Adams, it has no subsiding craters or smaller blow holes on it or about its base—at least none of recent age. Barrett Spur, Langille Crags, or Coopers Spur may have been such craters; but, if so, they are very old and have weathered to such a degree that they no longer have a crater-like appearance.

The volcano apparently became extinct before reaching the stage of the ejectment of the more basic basalts which Shasta and Adams poured out in comparatively recent times. In this connection, however, it might be well to state that there is, some ten miles to the northeast, a large lava flow, probably from fissure, that from a distance appears recent. It was not visited, but could be seen fairly well with field glasses, and at the distance resembled lava flows that lie on the north and south sides of Mount Adams and could probably be correlated in time with them. Neither timber nor grass has as yet begun to grow upon it.

The rock of which the mountain is built is greatly seamed and fissured. Water penetrates it easily, therefore, and, freezing, shatters great masses. On the lower slopes one sees all stages of such disintegration. There are boulders as large as a house shivered into a thousand pieces by frost. Some of them retain their original shapes, others are falling down, and yet others are but a pile of earth.

GOUGING BY GLACIERS

In the work of tearing down the mountain, ice has indeed played the star part. While the freezing of water into the joints has fractured the rock, the glaciers

have done the greater work in not only carrying away the debris that falls from the cliffs, but in gouging out canyons and cutting back into the bowels of the mountain itself. The amount of cutting going on at present is not inconsiderable, and from it one gets an idea of what it must have been during the periods of infinitely greater glaciation.

The wide U-shaped valleys of the Sandy and the Zigzag rivers are plainly glacier-sculptured. The intense forestation has covered up and the heavy rainfall has washed away much of the evidence, but in the valley floors one sees many large angular boulders which appear to be of drift origin. These were found as far down the Sandy Valley as the right-angle bend below Cherryville, where the river enters a canyon. On the bench north of the junction of the Zigzag and Sandy rivers, called Crutchers Mountain, the bed rock is deeply scored.

The drift in the Sandy Valley above the forks is much fresher in appearance and more clearly glacial than that below. The wagon road up the Zigzag above the Tollgate runs over what is clearly morainal material all the way to Government Camp and beyond. On its way it climbs Laurel Hill, a ridge of old granite rock which shows striæ and polish. Along the top of the ridge north of the Sandy River, between Hood and Last Chance Mountain, stretches the remnants of an old moraine.

In the park area between the White River and the East Fork of Hood River the rocks that are exposed are very hard, and here again were seen beautiful striæ and grooves.

How far this glaciation extended I do not know. I found no trace of it west of Cherryville, but at that place begin to appear what I take to be the terraces of the Willamette Sea of Pleistocene times, and the plot becomes too complicated for the novice.

Permit me to call attention, however, to the great cirques at the heads of the various branches of the Bull Run River and their comparatively low elevation. A closer study of the map reveals lesser cirques in many places. The ice undoubtedly swept through the low passes in the main divide at the head of Clear Fork and Bull Run Lake; also through Lost Lake down the Lake Branch.

These two lakes themselves offer much of interest to the geologist. The former was made possible by a fissure flow of lava in the bottom of the canyon, where now is the lower end of the lake, forming a dam behind which the water collected. This lava is unglaciated and is therefore more recent than the great glacier that carved out the canyon. The lake outlets through the lava, not over it. The lake level varies during the year as much as ten feet.

A DROWNED FOREST

Lost Lake, on the contrary, does not vary over a foot at most. It has a fair-sized outlet into Lake Branch. *One sees, when navigating it, tree-tops far below its surface.* In other words, here is a forest that has been drowned. Lost Lake Butte is an extinct volcano. A flow of lava from it has probably dammed the lake's outlet to the east, causing the basin thus made to fill and overflow to the north. Lost Lake when discovered contained trout, though it is now impossible for fish to come up Lake Branch into it because of falls. Bull Run Lake has no fish naturally, but white fish have been introduced. The isolated ridge north of Lost Lake is largely made up of a cinder deposit in which volcanic bombs of various sizes occur.

ENORMOUS MASSES OF DEBRIS

But, to return to our mountain, one of its most prominent features is the fan-like outwash on the southwest side. By glancing at the map you will see that this radiates from the gap in the crater's rim and probably bears a distinct relation to it. This whole side of the mountain, reaching from the ridge east of the White River Canyon to that between the forks of the Sandy River, is deeply covered with glacial debris. The small canyons at the foot of the White River glacier are trenched in this debris which

Crags
Glacier
Sandy Glacier
Zigzag Glacier
Cape Horn
Last
Bald Mtn
Ridge
Paradise
Timberline
Cooper Spur
Coe Glacier
Eliot Glacier
Newton Clark Glacier
Glacier
Glacier

once filled the old canyon completely. The Little and Big Zigzag canyons are cut in it. The Little Zigzag has not reached bottom; the Big Zigzag at its upper forks is in about 30 feet of basalt, but a little farther down stream it is still trenching in the drift. The south fork of the Sandy and Slide Creek are beginning the herculean task of cutting away the drift that nearly fills the old canyon that lay between Slide Mountain and Paradise Park on the south and Yocum Ridge on the north.

To account for this enormous mass of debris, there is this possible explanation: The forces that built the mountain left it with a well-developed summit crater about one-half mile in diameter and 500 to 700 feet deep, with the lip at the southwest side somewhat lower and probably of less resistant rock than that on the north side. When the age of ice came on, this crater became filled with snow and the mountain was covered with an ice-cap such as we now see on Rainier and Adams. Glaciers formed on the sides and gradually worked back until the whole southern rim of the crater was cut away and the materials that made it were spread out on the lower slopes and filled the canyons that had previously been trenched. The glaciers then extended back to the inside of the north rim as they still do. They cut away the floor of the crater, but the harder rock of the old neck resisted and divided them and survives as Crater Rock.

The other sides of the mountain have also been trenched more or less deeply and much debris is spread out below, but nowhere in such quantities as on the southwest.

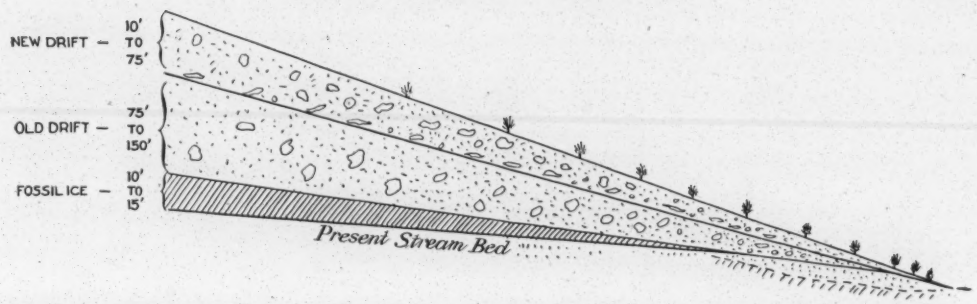
ABUNDANT FOSSIL ICE STILL FOUND

Let us now examine the White River Canyon more in detail. Unfortunately the map has not been extended enough to the south to shed light on the nature of this canyon below its immediate relation to the mountain. There seems, however, but little question that when the ice filled the Zigzag and Sandy valleys a similar glacier extended many miles down the White River. This glacier was deeply covered with debris from the ruined crater. So thick was this debris and so well protected by it was the ice that to this day some of the ice of the ancient glacier remains. In the section exposed by the cutting of the new streams, fossil ice to the depth of 10 to 15 feet may be seen at the bottom of the small ridge which Reid has called Moraine Mesa. The section of Moraine Mesa exposed is shown in the accompanying sketch.

The bottom layer is the fossil ice. This is covered with from 75 to 150 feet of morainal material. Above this is about three feet of black soil, or forest humus, on which rests or is rooted a confused mass of tangled logs, with an occasional stump standing erect. Some of these logs are above two feet in diameter. They are still wood in a good state of preservation, being neither carbonized nor silicified. The top layer is drift again of the same character as the lower layer and is from 10 to 75 feet thick. It indicates, of course, a return of frigid weather conditions and a readvance of the ice after a temperate climate period long enough, at least, to allow for the growth of the overthrown and buried forest.

This second drift sheet extends only from the forks of the smaller canyons at the head of the present valley back to the end of the existing glacier or possibly beneath it. It is too recent for vegetation to have made headway upon it. One or two small pines and a few grasses and bipines are all that it has. A few buried logs were observed on the west side of the mountain, near the end of one of the prongs of the Zigzag Glacier, which indicates a probably similar readvance of the ice on that side.

It is scarcely necessary to speak here of the glaciers as there are today. The map speaks for itself in regard to them. The Survey last year, for the first time in its history, adopted the method of contouring the glaciers, the contour lines on them to be shown in light blue. There



LONGITUDINAL SECTION OF MORAINE MESA, EXPOSED BY NEW STREAM CUTTING

are eight ice fields on the mountain which have been recognized as glaciers and given names.

I have mapped, in addition to these, four smaller fields as glaciers, of which the one between the Ladd and the Sandy is the largest and most interesting. The Sandy reaches the lowest elevation, about 5,700 feet, while the Eliot is the longest, about an even two miles from *bergschrund* to nose.

The three glaciers on the north side of the mountain present a most glorious picture as they cascade down from near the summit in great broken masses. After separating, below their common gathering ground, they assume the character of true alpine glaciers. The Newton Clarke, on the east side, though of great beauty, partakes more of the character of a cliff glacier. With the exception of the Zigzag, which is comparatively smooth, they are all very greatly crevassed and travel over them is difficult. On the whole, they are all probably receding, but owing to several recent hard winters they now appear to be advancing a little, except in the case of the Zigzag and the White River, where another condition intervenes, the volcano's heat.

IS THE ANCIENT VOLCANO AWAKENING?

The volcano has not been in eruption for untold centuries, except as the fissure flow that dams Bull Run Lake and the one that made the lava beds to the northeast be regarded as related to it. Since the mountain was first visited, however, there has been steam escaping from various places on it, but mostly from Crater Rock, together with gas, generally hydrogen sulphide.

Professor Russell, in his book on American Volcanoes, gives a picture taken in 1882 of a so-called fumarole on the south slope of Mount Hood, which was, as near as I can determine, just east of Crater Rock. This picture shows a well-shaped depression in the glacier from which steam was probably escaping. This fumarole apparently became inactive, or later visitors do not mention it.

In the last three years, however, the sleeping volcano has been warming up and stirring in its sleep. Last summer the old fumarole had so devloped that the White River Glacier is now cut in two at this point and its bed between Crater Rock and Steel Cliff, for 150 feet along its course, is exposed. Steam and noxious gases are escaping from fissures in the rock thus laid bare.

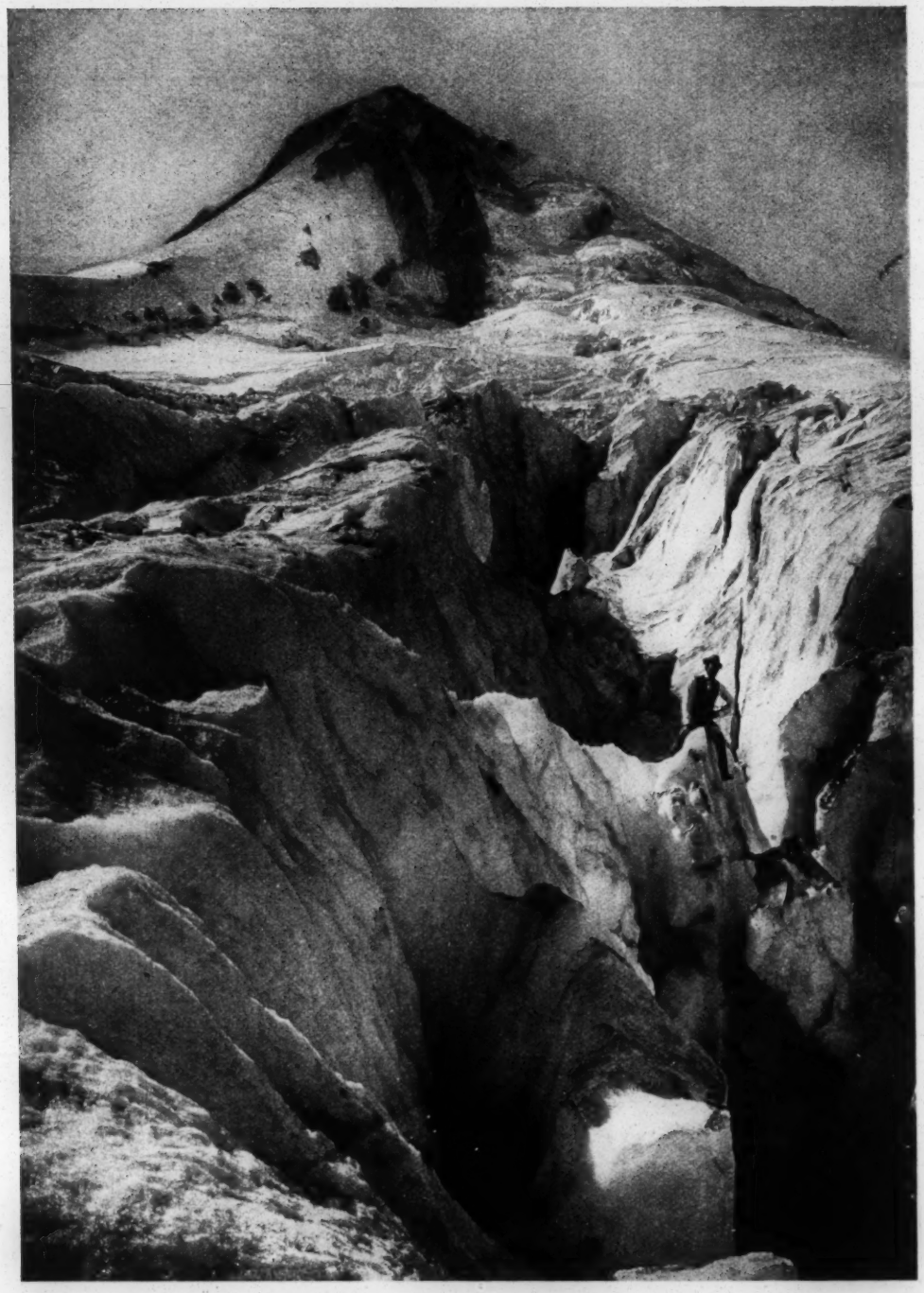
On Crater Rock steam escapes from numerous fissures and many places are too hot to hold the hand upon, but the most active place is on the north side of the rock, in a depression which is commonly called the crater. Here a considerable area formerly covered by the Zigzag Glacier has been laid bare.

On the 28th of August, 1907, my main camp was at Government Camp, five miles from the summit of Hood. For several days previous to this I had been with a side camp on the east side of the mountain. From there, during that time, it was noticed that Steel Cliff, the high east wing of the crater, was steaming more than usual. We had been hav-

Photos by N. B. Eckbo, U. S. Forest Service

CLIMBING ZIGZAG GLACIER: GUIDE IN FRONT CUTTING STEPS

AT WORK ON THE TOP, 11,225 FEET



ELIOT GLACIER, AT NORTHEAST SIDE OF MOUNT HOOD

Photograph taken at base of summit to show the deep crevasses at the limit of the glacier: Cascade National Forest, Oregon. Photo from U. S. Forest Service

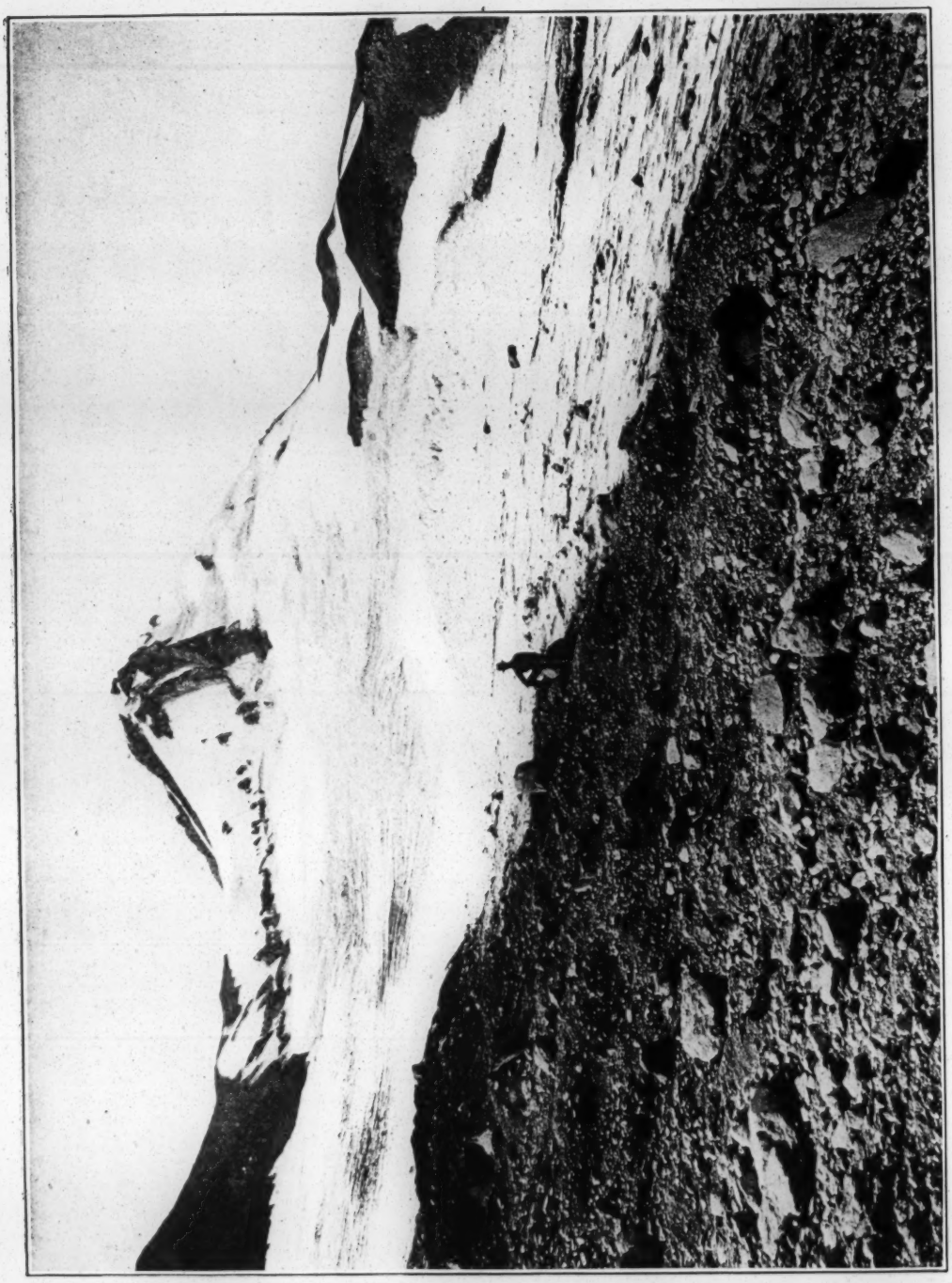


Photo from U. S. Forest Service

ANOTHER VIEW OF ELIOT GLACIER, ON MOUNT HOOD

ing rainy and foggy weather, with the mountain much of the time hidden from view, but the 28th was bright and clear. My cook, Wm. Hinshaw, of Portland, and teamster, O. G. McIntyre, of Salmon, Oregon, were in the main camp. They are men in whose word and common sense I believe reliance may be placed.

They saw a column of smoke, probably dense steam, rising from Crater Rock, high above the sky-line of the summit of the mountain. This persisted throughout the day.

There were probably as many as a dozen other people at Government Camp who also saw the smoke. An unsuccessful attempt was made to photograph it. My own view of that side of the mountain was effectually cut off by Steel Cliff. In the afternoon McIntyre came around to me. He says that when crossing the White River Valley he could look directly up the canyon, in behind Crater Rock, and the smoke appeared much plainer than it had from Government Camp. The stream, White River, as he crossed it that day, was at its usual stage.

MORE EVIDENCE OF VOLCANIC ACTIVITY

That night Hinshaw, from the main camp, saw with field glasses a glow from behind Crater Rock which he described as looking like a chimney burning out.

I returned the next day, the 29th, to Government Camp, crossing on the way th White River, which had swollen over night to an angry stream of treble its volume of the day before. The weather was cold, and though a drizzling rain had begun to fall in the early morning, *there was no warrant for the rise in the stream except the volcanic heat melting the glacier which is its source.* Clouds obscured the mountain for a week following the 28th.

I moved camp on the 30th out of sight of the crater, and during the month that remained of the field season saw no further signs of activity.

Mr S. N. Stoner, formerly of the Survey, on about the 12th of November, which was a very clear day, saw from Portland what he took to be smoke rising from Hood. I have heard of no further disturbance, and his observation at the distance of 50 miles is of course of questionable value.

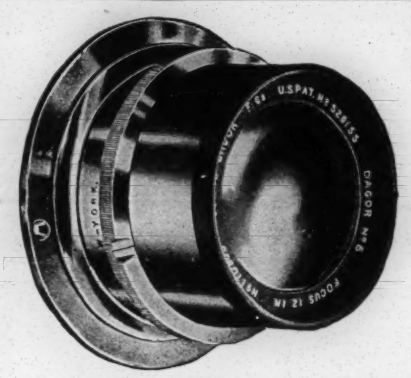
It is interesting to note that this activity of the old volcano was occurring at the same time that daily changes were being observed in the Bogaslof group of volcanic islands off the Alaskan coast.

Whether the phenomena observed last August presage an awakening of the old volcano to new life, or whether they were but a dying gasp, which over, the giant will relapse into a yet deeper and perhaps final sleep, time alone can determine. They do show, however, as Mr J. S. Diller has pointed out, that volcanoes like Pelee or Vesuvius, which are intermittently active, continue to feel throes of life at long intervals, but weaker and weaker with the passing of time, long after they are destructively active.

But for the present Mount Hood must be taken from the list of extinct volcanoes and placed at least among the doubtful.

ESKIMO BEAUTIES FROM GODTHAAB, GREENLAND

There are about 10,000 Eskimos in Greenland, most of them living in settlements along the southwest coast of Greenland, where contact with several hundred Danish settlers and with whalers has civilized many of them to a considerable extent. Photo by Capt. Roald Amundsen.



THREE IN ONE

Perfection in a Photographic Lens is possible only when

Perfect Computation
Perfect Grinding, and
Perfect Mounting

are combined in the same instrument

The most perfect computation does not lead to perfect pictures unless the most perfect mechanical devices are applied in the manufacturing.

Highly polished surfaces are of no avail unless they are in absolute accordance with perfect computation.

A perfectly computed and perfectly ground and polished lens is not better than a rectilinear when it is carelessly mounted.

The triple alliance of perfect computation, perfect grinding, and perfect mounting made for the

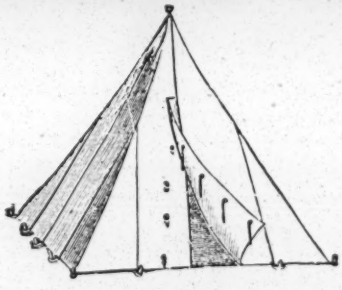
GOERZ LENSES

the high reputation they deserved earned for themselves

C. P. GOERZ AMERICAN OPTICAL COMPANY

CHICAGO	NEW YORK	SAN FRANCISCO
1514 Heyworth Building	52 Union Square East	703 Claus Spreckels Building

Guaranteed Waterproof Silk Tents



¶ We manufacture a complete line of Tents and Camp Goods for Engineers, Prospectors, and Explorers.

TRADE MARK
COMCO
BRAND

¶ Our goods are of the highest quality and we are prepared to fill all orders promptly.

Camp Outfit Manufacturing Co.
144 WATER STREET :: NEW YORK CITY
Send for our Catalogue C

BORDEN'S
PEERLESS BRAND
Evaporated Milk
(Unsweetened)

is perfectly adaptable in **ALL RECIPES** where milk or cream is required. Dilute to desired consistency and use same as fresh milk

CONVENIENT! **ECONOMICAL!**
Write for Recipe Book

BORDEN'S CONDENSED MILK CO.
"Leaders of Quality"
Est. 1857 NEW YORK

Your courtesy in mentioning the Magazine when writing will be appreciated

PUBLISHERS and authors, who want to embellish their books with the best maps that can be made, will find not only a most efficient service at our plant, but a complete map and data library and a hearty co-operation on our part. We compile, design, engrave and print maps for any purpose desired.

In addition to our map work, we print, design, engrave, for black or our Prismaprint Process color work, and bind,—we make books complete from start to finish.

THE MATTHEWS-NORTHRUP WORKS
BUFFALO, N. Y.

New York Office,
Madison Square Garden Tower.
Cleveland Office,
517 Citizens Building.

Canadian Pacific Railway

Across the Continent from Ocean to Ocean
Through the Canadian Rockies
The Grandest Mountain Range on the American Continent

CONNECTING AT QUEBEC
with the
MAGNIFICENT "EMPRESS" STEAMSHIPS
TO LIVERPOOL

Two Days on the Majestic St. Lawrence
Four Days from Land to Land

CONNECTING AT VANCOUVER WITH OUR STEAMSHIP LINES ON THE PACIFIC

Shortest and Quickest Routes
to Japan, China, Hawaiian and Fiji Islands, Australia, and New Zealand

For Pamphlets and All Information . Apply to
E. V. SKINNER, A. T. M.
458 Broadway . . . . . New York

Ready This Summer, 2 volumes, nearly 800 pages, with about 139 Illustrations and 3 Maps. $8.00 net. Sent prepaid on receipt of the price.

The North-West Passage

Being the Record of a Voyage of Exploration of the Ship Gjoa, 1903-1907

BY
ROALD AMUNDSEN

With a Supplement by First Lieutenant Godfrey Hansen, Vice-Commander of the Expedition

The following letter from the famous Norwegian novelist, **Bjornstjerne Bjornson,** to the author will indicate the fascination of the work:

"ROME, MARCH 29, 1908.

"I find that your book is the most entertaining among the whole of the North Pole literature. Whoever commences to read it will feel bound to go on. It possesses a peculiar property which I wish to draw attention to. It captivates the imagination of boys and youths so strongly that it has a beneficial effect, as every page tells what a precious treasure a healthy and vigorous body is, and what a courageous spirit it imparts; the result is that your book from the Polar Regions has become a boon to the Norwegian youths, who will strive to accomplish similar things."

NEW YORK
E. P. DUTTON & CO., 31 West 23d St.

Your courtesy in mentioning the Magazine when writing will be appreciated

The National Geographic Magazine Reaches Directly the People Needing the Services of Experts

CLASSIFIED ADVERTISEMENTS

COMBINES DIGNITY
DIRECTNESS
AND A MINIMUM OF
EXPENSE

For Terms,
Address Advertising Manager
NATIONAL GEOGRAPHIC MAGAZINE
Washington, D. C.

ENGINEERING EXPERTS—MINING, MECHANICAL, ELECTRICAL, CIVIL

Coal Mines and Coal Properties Examined; will also take charge of the development and working of mines in Washington; 19 years' practical experience in Washington and Canadian coal fields.
F. A. HILL, Consulting Engineer,
609 Mutual Life Building . . Seattle, Washington
Phone, Main 432; Residence, East 741.

H. E. SMITH, Mining Engineer, Box 335, Ft. Smith, Ark. General and Secret Investigations made in the Lead and Zinc Fields of Missouri, Oklahoma, and Arkansas for non-residents.

E. M. JONES, 1125 James Bldg., Chattanooga, Tenn., Mining Engineer—reports, plans for development, and supervision of operations of coal properties. No surveys made. Experience: Penna. Anthracite Field, Penna., Maryland, W. Va., and Tenn. Soft Coal Fields.

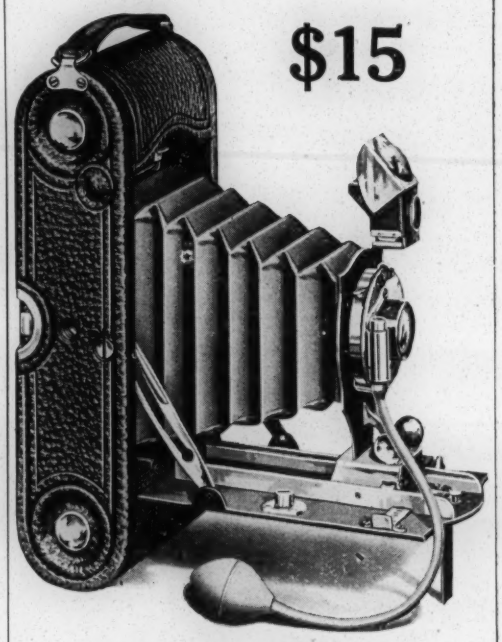
STEPHEN E. KIEFFER, M. Am. Soc. C. E. Civil and Hydraulic Engineer. Expert solution of Water Supply and Irrigation Problems in the Arid West and Mexico. **First National Bank Building, Berkeley, California.**

PATENT ATTORNEYS

ALEXANDER & DOWELL, Attorneys at Law. Registered Solicitors of United States and Foreign Patents. Practice in all United States Courts.
607 Seventh Street . . Washington, D. C.

TUTOR

HOWARD C. JENNESS, A. B. (Harvard), Tutor, will prepare boys for the leading colleges, the Naval Academy, and West Point. Successful experience at Harvard. Special classes for men wishing to enter The George Washington University on certificate.
Telephone. **Apt. 41, 1723 G St., Washington, D. C.**



$15

1A Folding Pocket Kodak *Special*

Just as good as a camera can be made—so small as to never be in the way.

There has never before been so much quality put into so small a camera—in lens and shutter and mechanical precision it is right. Makes the popular 2½ x 4¼ pictures, the camera itself measuring but 2 x 3¼ x 8 inches. Fitted with Rapid Rectilinear lenses having a speed of *f.* 8 and the reliable F. P. K. Automatic Shutter. It fills every requirement of those who demand a perfect combination of convenience and efficiency. Price $15.00.

EASTMAN KODAK CO.
Rochester, N. Y.,
The Kodak City.

Catalog of Kodaks free at the dealers or by mail.

Your courtesy in mentioning the Magazine when writing will be appreciated

The Prestige of Our Splendid "WHITE HOUSE" COFFEE

Will most certainly inspire perfect confidence in our equally superb "White House" **TEAS** which are put up in ¼ & ½ lb. carefully sealed tins and warranted to give complete satisfaction.

BOTH "WHITE HOUSE" COFFEE & "WHITE HOUSE" TEAS ARE THE PRODUCT OF THE MOST FAMOUS PLANTATIONS IN THE WORLD.

"WHITE HOUSE" TEAS ARE SOLD UNDER THESE DISTINCTIVE NAMES: "FORMOSA OOLONG" "BLEND" "INDIA & CEYLON" "ORANGE PEKOE" "ENGLISH BREAKFAST"

Persia: The Awakening East

BY

W. P. CRESSON, F. R. G. S.

The latest book dealing with the march of events in the Middle East and the marvelous political changes that are transforming this ancient oriental kingdom

PRICE, $3.50

Profusely Illustrated. Octavo. Decorated Cloth

J. B. LIPPINCOTT & CO., Publishers

Washington Square . . Philadelphia, Pa.

HENRY ROMEIKE'S BUREAU OF PRESS CUTTINGS

¶ Reads every paper of importance published in the United States, and through its European agencies in London, Paris, Berlin and Vienna every paper of importance published in Europe and the British Colonies. One subscription on any given subject will bring notices from the United States, and if desired, also from European papers.

WRITE FOR TERMS

NEW YORK
33 UNION SQUARE

Your courtesy in mentioning the Magazine when writing will be appreciated

Photographing Wild Game With Flashlight and Camera

BY

HON. GEORGE SHIRAS, 3RD

A number of the magazine, published July, 1906, containing seventy wonderful pictures of wild animals and birds taken in their natural surroundings. These interesting photographs are the result of years of indefatigable effort given the science of wild animal photography by Mr. Shiras, who was the originator of the sport of hunting with the camera.

So many requests have been received for this number that a limited extra edition was printed to supply the demand.

THE SERIES PRESENTS A SPLENDID OBJECT LESSON FOR CHILDREN IN THE STUDY OF NATURAL HISTORY

PREPAID BY MAIL, 50c. **ORDER AT ONCE**

The National Geographic Magazine

WASHINGTON, D. C.

"Every man and woman should know how to use firearms with safety."—THEODORE ROOSEVELT.

The PISTOL and REVOLVER

By A. L. A. HIMMELWRIGHT, President of United States Revolver Association

A HANDY pocket-size volume of 157 pages of practical information covering the entire subject of Pistol and Revolver shooting. This work is strictly up-to-date, including the latest developments in smokeless powder; the 1908 Revolver Regulations and Practice of the United States Army, the United States Navy, and the National Guard; the Annual Championship Matches and Revised Rules and Regulations of the United States Revolver Association, etc. Besides being a useful, practical hand-book for the EXPERIENCED marksman, the work will also prove particularly valuable for BEGINNERS.

Contents.—Historical: Arms—Military, Target, Pocket; Ammunition—rim fire, central fire; Sights; Position; Target Shooting; Revolver Practice for the Police; Pistol Shooting for Ladies; Clubs and Ranges; Hints to Beginners; Selection of Arms; Manipulation; Position and Aiming; Target Practice; Cleaning and Care of Arms; Reloading Ammunition—primers, shells, bullets, powders, reloading. Appendix.—Annual Championship Matches of the United States Revolver Association, Rules and Regulations governing the matches, etc. Records of the United States Revolver Association.

The volume is printed on fine coated paper with many illustrations and is bound in three styles: Paper, 60 cents; Cloth, $1.00; Full Morocco, $1.50.

Write at once, enclosing remittance, and we will mail direct.

National Geographic Magazine . . . Washington, D. C.

Your courtesy in mentioning the Magazine when writing will be appreciated

We Are All Geographers

EOGRAPHY is just a term for the science of locating your place on the map.

If you are interested in knowing where your fence ends and your neighbor's begins, if you have ever made an excursion or traveled far enough from your habitat to long back to it a bit, you are interested in modern geography.

The man with a latch-key and an office address is interested. He is a city geographer. The gentleman who sleeps in his blanket is a nature geographer. The difference is only in the condition. The kind is the same.

The monthly edition of the NATIONAL GEOGRAPHIC MAGAZINE is **40,000,** a copy by direct subscription reaching each of the **35,000** members of the Society, the balance to subscribers.

The publication is not of the usual garden variety of news-stand magazines, but is subscribed for direct by the 40,000 people who are of the foremost of the Nation's citizens, the home-owning class; Prominent Business Men, Bankers, Railroad Officials, Capitalists, Scientists, Directors of Far-reaching Government Projects, the greatest traveling class in the country, people who want the best and have the wherewithal to purchase it.

It pays to advertise in the National Geographic Magazine because it reaches people who take it seriously and who know the magazine will not accept advertising that is not of the highest standard.

ITS PULLING POWER? Well, for instance, it is a positive fact that directly accruing from six pages of advertising we received 11,921 orders for the recent publication, "Scenes from Every Land," at $1.00 each—Eleven thousand nine hundred and twenty dollars from six pages of advertising! !

Our direct subscription is a combination rarely met with in the advertising world—Quality with Quantity. It will be a pleasure to take the matter up directly with you.

National Geographic Magazine

Address Advertising Manager . . Washington, D. C.

WE PRINT THIS MAGAZINE

JUDD & DETWEILER, Inc.

PRINTERS

of BOOKS, CATALOGS
Etc. ¶A SPECIALTY *of*
BRIEFS *and* RECORDS

420-422 Eleventh St. N. W.

WASHINGTON, D. C.

OUT-OF-TOWN WORK SOLICITED

SPRATT'S DOG CAKES

Are the Best and Cheapest

Send for FREE Catalogue, "Dog Culture," which contains practical chapters on the feeding, kenneling, and general management of dogs, also chapters on cats

SPRATT'S PATENT
(A.M.) LTD.

Newark, N. J.
San Francisco, Cal.
Boston, Mass.

St. Louis, Mo.
Cleveland, Ohio
Montreal, Can.

THE WASHINGTON LOAN AND TRUST COMPANY

WASHINGTON, D. C.

Capital	$1,000,000.00
Surplus and Profits .	$750,000.00

INTEREST PAID ON DEPOSITS SUBJECT TO CHECK
LOANS MADE ON REAL ESTATE AND COLLATERAL
SAFE DEPOSIT BOXES
REAL ESTATE DEPARTMENT
TRUST DEPARTMENT
ACTS AS EXECUTOR, ADMINISTRATOR, TRUSTEE, Etc.
LETTERS OF CREDIT AND FOREIGN EXCHANGE

JOHN JOY EDSON,
President

WOODWARD & LOTHROP

Importers and Retailers

INVITE ATTENTION TO THEIR SELECTIONS AND IMPORTATIONS IN DESIRABLE MERCHANDISE, COMPRISING IN PART

Paris and London Millinery, Silks, Velvets, High-class Dress Goods, Ready-to-Wear Outer and Under Garments for Men, Women, Girls, and Boys, Hand-made Paris Lingerie, Bridal Trousseaux, Corsets, Infants' Outfittings, Hosiery, Laces, Ribbons, Handkerchiefs, Embroideries, Linens, Upholstery Goods, Books, Stationery, Card Engraving; also Paris, Vienna, and Berlin Novelties in Leather and Fancy Goods; Sterling Silver Articles, Lamps, Clocks, Bronzes, Cut Glass, China, etc., for Wedding, Birthday, and Anniversary Gifts.

Mail Orders Receive Prompt Attention ***Correspondence Solicited***

10TH, 11TH, F, AND G STREETS N. W.
WASHINGTON, D. C.

PRESS OF JUDD & DETWEILER, INC., WASHINGTON, D. C.